

Universal Accessibility

On the need of an empathy-based architecture



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TAMPERE UNIVERSITY OF TECHNOLOGY



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Universal Accessibility

On the need of an empathy-based architecture

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Accessibilitat Universal

Sobre la necessitat d'una arquitectura basada en l'empatia

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I'm grateful to my supervisors for their constant support during this long doctoral journey,
and my pre-examiners for reminding me the essence of the journey.

To my family and close friends, thank you for being there, always.
I am a better person because of you.

This book is dedicated to all who have ever felt *different* due to their surroundings.
I hope it brings some light.

Resum

Accessibilitat Universal: Sobre la necessitat d'una arquitectura basada en l'empatia és una tesi doctoral centrada en el paradigma del disseny arquitectònic accessible. Partint de la primera comprensió de l'accessibilitat en l'arquitectura, s'analitza l'evolució del concepte des de les últimes dècades fins a l'actualitat, per tal d'avaluar el seu significat actual.

La hipòtesi és que totes les teories vigents que avaluen i defineixen l'accessibilitat en l'arquitectura no estan correctament enfocades i/o no estan suficientment vinculades a la pràctica professional, ja que el postulat principal d'aquesta investigació és que la qualitat dels entorns construïts és pobre en matèria d'accessibilitat. Resulta necessari evolucionar de l'actual punt de vista simplista de l'accessibilitat entesa com a entorn sense barreres arquitectòniques, cap a un enfocament més inclusiu. Cal entendre que l'accessibilitat abasta necessitats existencials superiors tals com l'amenitat i la identitat. És a dir, cal que tinguem en consideració com percebem i experimentem l'entorn construït. Això resulta crucial per al benestar psicològic de tota persona. Per a tothom resulta important el sentiment de pertinença, el sentir que formem part de, i no que estem apartats de la societat i del nostre entorn; per a tots resulta indispensable la sensació de normalitat.

És per aquest motiu que la premissa d'aquesta tesi defensa que és necessari un enfocament empàtic cap al disseny d'entorns accessibles. L'empatia és essencial per tal de satisfer aquelles necessitats 'suprafuncionals', aquells aspectes socials, emocionals, espirituals i culturals que són rellevants per a tots nosaltres de la mateixa forma. Aquí rau el veritable plaer, el sentiment de benestar i la percepció d'una bona vida. L'empatia és la clau i el punt de partida per derrotar el 'disseny per al discapacitat' i per a l'èxit d'una arquitectura inclusiva. Si ho aconseguim, estarem front dissenys duradors que són capaços d'assumir, d'una manera saludable, les diverses necessitats que sorgeixen al llarg d'una vida. És a dir, dissenys sostenibles que proporcionen qualitat de vida. Si ho aconseguim, certes conductes predeterminades i prejudicis vers persones amb discapacitat seran a la vegada enderrocats.

En resum, aquesta tesi és una reflexió general sobre el paradigma de l'arquitectura accessible, observat des de diversos punts de vista, i arribant a unes conclusions finals. Per tant, aquesta tesi no tracta tant de donar instruccions sobre com construir de forma accessible, sinó que més aviat reflexiona sobre el per què és necessari. Aquesta dissertació pretén canviar actituds respecte a l'accessibilitat, de manera que sigui veritablement integrada dins del disseny arquitectònic. El resultat serà una arquitectura per a tothom en la que la sostenibilitat i la justícia social quedarà assegurada.

Paraules clau: *accessibilitat universal, empatia, simulació de discapacitats, accessibilitat desapercebuda, disseny capacitant.*

Abstract

Universal Accessibility: On the need of an empathy-based architecture is a PhD thesis researching the paradigm of accessible architectural design. Starting from the very first understanding of accessibility in architecture, it analyses the evolution of the concept over recent decades up to the present, in order to evaluate its current significance.

The assumption of this dissertation is that all current theories concerning accessibility in architecture are not properly approached and/or they are poorly linked to architectural practice, since the main postulate of this thesis is that the quality of built environments is poor in respect to accessibility. Therefore, this thesis aims to point out the main problems that accessible designs face nowadays and, more importantly, to rationalize why this situation must be reversed while also exploring the tools for doing this.

Keywords: *universal accessibility, empathy, disabilities simulation, unnoticed accessibility, enabling design.*

Preface

Accessibility standards were defined decades ago and are continuously being updated to more precise and restrictive regulations, aiming at higher compliance for fully accessible—thus, non-discriminating—designs. Hence, we cannot deny the existence of abundant literature concerning how to design accessible built environments. Nevertheless, the fact is that the quality of designs in respect to accessibility is doubtful on many occasions.

The regulations give plenty of instructions on how to design the built environment to be ‘wheelchair friendly’ and have also recently introduced tools for being ‘blind friendly’, but they have not adopted a ‘design for all’ understanding. At least, not in a way that is holistically inclusive. Many current accessible designs are not designs meant for all, but just mere differentiated ‘designs for the disabled’ that do not form a part of the whole ‘normal’ environment. Consequently, non-disabled people rarely use them, even when they are more practical, because they do not identify themselves with such segregated ‘designs for the disabled’.

We must be aware that architecture is the reflection of society’s customs and needs. To some extent, the role of the architect is to design what cities and buildings look like, which directly or indirectly influences how we inhabit them. Thus, it is essential to consider that every project decision determines some results that are gradually transformed into society’s habits. Therefore, a lack of precision in design can provoke a mistaken social awareness of the capabilities of some people, which ends up in discrimination. Architects must be able to understand society as a whole, which is made up of diverse people with differing abilities, all with the same rights to enjoy equally the quality of the built environment.

What is more, if accessibility evolves from a simplistic view of barrier-free environments towards a more inclusive approach, some standardized behaviours and prejudices will be defeated. Accessibility, as it should be understood, must also comprehend higher existential needs such as pleasantness and identity; that is, it must take into consideration how we do perceive and experience the built environment. This is crucial for the psychological wellbeing of the users. We all need belonging, to feel part of and not separated from society and our environment; we need a sense of normality.

In such a scenario of holistically inclusive built environments, the result will also be higher sustainable designs; because, on the one hand, the durability of design will be ensured thanks to the introduction of accessibility parameters that forecast possible future needs that stem from ageing, for instance. Furthermore, if on the other hand accessible designs have been approached by truly considering supra-functional needs, emotional durability will also be ensured, since people will be keen to use them over the long-term.

The premise of this dissertation is that an empathic approach is necessary for designing an accessible built environment that goes beyond the regular barrier-free requirements, beyond functionality and usability concerns. Empathy is essential to satisfy the ‘supra-functional needs’, those social, emotional, spiritual, aspirational and cultural aspects that are relevant to all of us equally. Herein lies the real pleasure, the sense of wellbeing and perception of a good life. Empathy is the key and starting point for defeating the ‘design for the disabled’ and for success in achieving inclusive architecture. If we do so, we will be looking at long-term designs that are able to healthfully support needs that cover a human lifespan. Thus, sustainable designs which provide quality of life.

In short, this thesis is a general reflection regarding the paradigm of accessible architecture, observed from different points of views, and arriving at some final thoughts. Indeed, ‘thesis’ (from Greek ‘*tithenai*’) means ‘to place’, ‘to position’; thus this thesis is no other than my position, my point of view on the subject of accessibility in architecture. Conducting research in architecture is also about gathering positions and thought experiments. Of course, these can be discussed, and this is the point indeed of many PhD; to reflect and throw some new knowledge aiming at improving a current situation.

To sum up, this thesis is not so much about giving instructions on how to build accessible architecture, but it instead reflects on *why* it is necessary. This dissertation attempts to change attitudes regarding accessibility, so that is truly embraced with all normality as designing architecture for all; that is, architecture in which sustainability and social justice in all design is ensured.

Barcelona 23.04. 2016

Marta Bordas Eddy

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List of Acronyms and Abbreviations

ABA: Architectural Barriers Act

ADA: Americans with Disabilities Act

AIP: The Accessible Icon Project

ARG-UCL: Accessibility Research Group from the University College London

ATH: Accessibility, Topography and Heritage

CABE: Commission for Architecture and the Built Environment

CAD: Computer-aided Design

CAE: Centre for Accessible Environments

CDG: Charles de Gaulle

CEUD: Centre for Excellence in Universal Design

CO₂: Carbon dioxide

CRPD: Convention on the Rights of Persons with Disabilities

CTE: Código Técnico de la Edificación (The Technical Building Code)

CUD: Center for Universal Design

CUDE: Center for Universal Design in Education

DAN: Design for Ageing Network

DfA: Design for All

DfA India: Design for All Institute of India

DDA: Disability Discrimination Act

EC: European Commission

ECA: European Concept for Accessibility

EIDD: European Institute for Design and Disability

ENSAM: École Nationale Supérieure d'architecture de Montpellier (School of Architecture of Montpellier)

EPSEB: Escola Politècnica Superior d'Edificació de Barcelona (School of Building Construction of Barcelona)

ETSAV: Escola Tècnica Superior d'Arquitectura del Vallès (School of Architecture of the Vallès)

EU: European Union

EuCAN: European Concept for Accessibility Network

FAQs: Frequently Asked Questions

FAUTL: Faculdade de Arquitectura Universidade de Lisboa (Faculty of Architecture University of Lisbon)

GPS: Global Positioning System

GRP: Generation Research Program

GUDC: Global Universal Design Commission Inc.

G1: Working group 1

G2: Working group 2

G3: Working group 3

G4: Working group 4

G5: Working group 5

G6: Working group 6

G7: Working group 7

G8: Working group 8

HCDI: Human-centred Design Institute

HHC: Helen Hamlyn Centre

IAQ: Indoor Air Quality

IAUD: International Association for Universal Design

ICF: International Classification of Functioning, Disability and Health

ID: Inclusive Design

IDeA Center: Center for Inclusive Design and Environmental Access

IDESCAT: Institut d'Estadística de Catalunya (Statistical Institute of Catalonia)

IDS: Inclusive Design Standards

iF e.V.: Industrie Forum Design e.V.

IHCD: Institute for Human Centered Design

ISA: International Symbol of Access

ISO: International Organization for Standardization

ISRD: International Society for Rehabilitation of the Disabled

JADE-HS: Jade Hochschule (Jade University of Applied Sciences)

LHA: Livable Housing Design

LIONDAU: Ley de Igualdad de Oportunidades, No Discriminación y Accesibilidad Universal (Law on Equality of Opportunities, Non-discrimination and Universal Accessibility)

LLCD: London Legacy Development Corporation

LOCUS IP: Let's Open Cities for Us Intensive Programme

LOC/TUS: LOCUS and LOTUS

LOTUS IP: Let's Open Tourism for Us Intensive Programme

LTH: Lunds Tekniska Högskola (Faculty of Engineering, LTH)

NCSU: North Carolina State University

NDA: National Disability Authority

NGO: Non-Governmental Organisation

NID: National Institute of Design

NIH: National Institutes of Health

NPO: Non-Profit Organisation

NYC: New York City

ODA: Ontarians with Disabilities Act

ODA: Olympic Delivery Authority

OHCHR: Office of the High Commissioner for Human Rights

PEPUDA: Promotion of Equality and Prevention of Unfair Discrimination Act

PK: Politechnika Krakowska (Cracow University of Technology)

PRM: People with Reduced Mobility

PwD: People with Disabilities

RCA: Royal College of Art

RIBA: Royal Institute of British Architects

RERC-UD: Rehabilitation Engineering Research Center on Universal Design

SIG: Special Interest Group on Inclusive Design

TNC: Teatre Nacional de Catalunya (National Theatre of Catalonia)

TUT: Tampere University of Technology

UAUIM: Universitatea de Arhitectură și Urbanism “Ion Mincu” (“Ion Mincu” University of Architecture and Urbanism)

UB: University at Buffalo

UCL: University College London

UD: Universal Design

UD e-World: Universal Design e-World

UDE: Universal Design Education

UDEP: Universal Design Education Project

UDI: The RL Mace Universal Design Institute

UDI: Universal Design for Instruction

UDIP: Universal Design India Principles

UDL: Universal Design for Learning

UD&C: Universal Designers & Consultants

UID: Universal Instructional Design

UK: United Kingdom

UN: United Nations

UN-Enable: United Nations Enable

UNIRC: Università degli Studi Mediterranea di Reggio Calabria (Reggio Calabria University)

UNWTO: United Nations World Tourism Organization

UPC: Universitat Politècnica de Catalunya – BarcelonaTech

URV: Universitat Rovira i Virgili (Rovira i Virgili University)

USA: United States of America

WHO: World Health Organization

1

Introduction

1.1 Purpose and scope of the research

The **purpose** of this dissertation is to reflect on the paradigm of accessible design, i.e., trace the origins of the very first ‘accessibility understanding’, analyse how it has evolved over recent decades up to the present, and evaluate its current significance.

As will be explained in detail in following pages, the first thoughts on accessibility emerged in the 1960s, and it originally had a strong link to barrier-free design, which was understood as a mere elimination of architectural barriers to the disabled. Shortly after that, in the 70s, accessibility was represented worldwide by the well-known wheelchair symbol. This barrier-free concept, initially aimed exclusively at people with disabilities (hereafter PwD), and more particularly at wheelchair users, progressively evolved into the idea of ‘Universal Design’ (hereafter UD) for everyone, especially in the USA of the 1980s. Ronald L. Mace coined the term for the first time, describing it as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” [Connell et al., 1997].

However, the term ‘universal design’ has been found to be controversial in recent times, since it suggests the idea of a single ‘universal solution’ to meet the needs of all people; it evokes the thought of ‘one size fits all’, which can be misleading. Thus, new terminology has appeared in the 90s and 00s to palliate this ambiguity, such as ‘Inclusive Design’ (hereafter ID), or ‘Design for All’ (hereafter DfA). DfA is used more in Europe and Scandinavia, while ID prevails in the UK. Even in the USA—the main land of UD—inclusive and universal design are used interchangeably. In addition, it is noteworthy that accessibility in the USA is still very much linked to a barrier-free idea that is conceived exclusively for the disabled; whereas, in the EU, accessibility has a broader understanding and is linked more to a comprehension of universal design that determines a design for all concept.

There is a visible, worldwide conflict in coexistent terminology, which is not so abnormal for a relatively new field. Each varying term aims at more precise definitions and at eliminating certain undesired connotations, which grow mainly on a geographical basis. Still, today we can find academics and institutions coining new terms, such as human-centred design or user-friendly design, which aim to specify a more accurate understanding of accessibility that expands increasingly into its broadest sense.

To sum up, we could say that the early concept of barrier-free design has developed gradually and progressively toward more embracing terms, focusing attention not only on PwD but on the needs that are common to us ALL. ‘Inclusiveness’, ‘user-centred design’, ‘design for all’, and many others, are terms used to refer to one fairly similar concept: design with everyone in mind, regardless of their age, ability, or status in life, by means of including the needs of the widest number of consumers under

various circumstances, so that nobody feels excluded. If this is achieved, we are looking at long-term designs that are able to healthfully support needs that cover a human lifespan. Thus, sustainable designs that provide quality of life.

Nevertheless, the **assumption** of this dissertation is that all these theories concerning accessibility in architecture are not properly approached and/or they are poorly linked to architectural practice, since the main postulate of this thesis is that the quality of built environments is poor in respect to accessibility. Regrettably, we too often find many examples of accessible environments with poor design quality:

On the one hand, there are many examples where the solution for providing accessibility in architecture has been reduced to secondary entrances and segregated spaces for the disabled; e.g., a rear entrance ‘for the disabled’ as an alternative to the non-accessible main one, an isolated toilet ‘for the disabled’ that is separated from the other public restrooms, etc. These examples can easily be judged by many as discriminatory.

On the other hand, we can find several cases where accessibility is applied as a standardized solution, often with orthopaedic appearances and a clear lack of aesthetic integration with its surroundings. Aesthetic concerns seem to be excluded from the project while accessibility is considered a mere technical issue that has to be accomplished at some point in the project’s development. It may even be considered sometimes a complex technical aspect that external specialists will solve later on.

The problem is that accessibility is left out of the realm of architecture when accessible design is not considered in unity within the whole architectural design, and designers either accept excluded paths and other areas for the disabled or they leave it till the end to be solved a posteriori. Thus, the result is often segregated solutions lacking integration as a unity, in terms of both composition and aesthetics, that often become mediocre solutions when accessibility is just a matter of placing a sticker with the ‘wheelchair symbol’ and little else. Therefore, in all these examples, accessibility is little more than barrier-free design.

It is worth asking why this is happening when there are many theories in this respect. One explanation is probably that, despite the fact that there is UD / ID / DfA literature, the compulsory demands to fulfil are the accessibility standards and regulations for the built environment. Besides the fact that the standards require different dimensions and designs depending on the state or country where they apply, the main issue is that they are still too exclusively focused on barrier-free design for the disabled. The regulations give instructions on how to design the built environment to be ‘wheelchair friendly’ and have also recently introduced tools for being ‘blind friendly’, but they have not adopted a design-for-all understanding; at least, not in a way that is holistically inclusive. Therefore, we could say that the standards and regulations are partially responsible for misleading and generating the problem to some extent.

Probably for this reason, different universities and institutions specialized in the subject have been created in order to promote, complement, assist, and clarify the needs and wills of accessibility. Indeed, several academics have approached the matter of accessibility by broadening its understanding towards designing for all; and several lists of UD / ID / DfA principles have been described over the years. The most renowned ones are *The Seven Principles of Universal Design*, defined by the Center for Universal Design (CUD), based at the College of Design at NCSU in the USA. To note that all of the most relevant UD / ID / DfA principles will be critically reviewed in the *Annex A* enclosed within this dissertation, with the aim to bring together those that coincide while also revealing new understandings.

To **validate the hypothesis** of the poor quality of built environments in respect to accessibility, I will attempt to evidence how accessibility functions in actual practice.

To that end, questionnaires launched among People with Reduced Mobility (hereafter PRM) will be analysed on the one hand in order to gain a perception of accessible design in real practice. That is, the primary users will be asked about accessibility, in order to learn their opinion of the pros and cons and thus attempt to determine how accessible design fails nowadays. The questionnaires, along with its complete and extensive analysis, can be found in the *Annex B. PRM Surveys*, whereas its primary conclusions will be included in the main text of this PhD dissertation. On the other hand, accessibility will be evaluated in an academic context, not only by reviewing all the literature in this respect, but also by learning about its real teaching in Schools of Architecture. This will be achieved through questionnaires answered by students in 9 European countries, which comprehensive description is enclosed within the *Annex C. LOC/TUS Surveys*.

As will be reasoned out in the following pages, many current accessible designs are not designs meant for all, but just mere ‘designs for the disabled’ or even ‘designs for wheelchair users’; i.e., differentiated designs that do not form a part of the whole ‘normal’ environment. Consequently, non-disabled people rarely use them, even when they are more practical, because they do not identify themselves with such segregated ‘designs for the disabled’. For this reason, accessibility must go far beyond a mere barrier-free approach, which concentrates mainly on aspects of usability and safety; it must also contemplate aspects of comfort, aesthetics, affordability, flexibility, etc. All these questions take part in the general theory of architecture normally, and this is how it should also be in theories of accessibility. What is more, accessibility needs to be included in the general theory and teaching of architecture, so that it is comprehended as one whole part of the same design. We should not differentiate between accessible architecture and architecture, but the whole of architecture should be accessible. In such a scenario, time will eliminate the need to distinguish between accessible areas (i.e., placing a ‘wheelchair symbol’ sticker to signal an accessible secondary entrance) and their surroundings.

This is necessary because all of us expect our built environments to be similarly satisfying in terms of usability, pleasantness, and wellbeing. Thus, if accessibility is not also approached in these terms, people with a choice will avoid such accessible installations due to their inherent stigma of disability. In contrast, it is only when everyone is persuaded and keen to use an accessible environment that we will be on the right track towards genuine architecture for all.

The **premise** is that we need to empower our empathic capacities, so that we do not approach the matter of accessible design as ‘us’ and ‘them’. That is, architects must not design for the whole community (us), and then add solutions for the disabled minority (them). Rather to the contrary, design must always be for all. This, perhaps obvious observation is relevant since, as I will prove later on my text, the general data obtained through the research backs up the fact that, on the one hand, many disabled users feel general discontent towards accessible solutions and, on the other hand, many architecture students are little aware of the needs of PwD and their related accessibility requirements.

If we aim to design inclusive environments for all, the first step is to learn the diversity of population’s needs; and to do that an empathic exercise is necessary so that we can picture, absorb and comprehend the essence of others’ needs. Therefore, we need to have an empathic respect towards the user; that is, we must take into account what the users expect in terms of functionality, comfort, and aesthetics. Also, we need to empower an empathic attitude towards the environment; that is, we must care about how the design fits into its surroundings in terms of respect for the identity of the place, the durability of the design, or the sustainable use of the local resources.

Thus, the context of this investigation is to research the connections and implications of accessible design and empathy. In general, accessibility requirements are not understood as a staple priority, as a global benefit that architects must consider because accessible environments are a synonym for an easier and more comfortable life for everyone. In contrast, accessibility standards are often viewed as impositions by laws that limit design and increase the cost of the project; and this comprehension is the one that must be reversed. The next question that arises is whether all these requisites can actually be specified in regulations or, rather to the contrary, if abstract concepts such as aesthetics, emotions and wellbeing (which cannot be delimited in building codes) must be taught in schools of architecture.

For this reason, this thesis will present a case study that evaluates the experience of teaching accessibility, not by strictly following the standards but by promoting an empathic approach towards design. The objective is to reverse the predominant situation of ‘designs for the disabled’ and to truly embrace the concept of designs for all, i.e., inclusive environments. The study is carried out in the conflictive terrain of historic built environments, since these are the most difficult to deal with nowadays. Obviously, in designing new architecture from zero, it becomes much easier to introduce accessibility in an integrated way; but this is not so when accessibility has not been forecasted and has to be solved a posteriori. Hence, the main aim of the case study is to innovate and learn how to introduce improvements for better accessibility in heritage-protected surroundings.

The **ultimate aim** of this thesis concentrates on gathering knowledge about how accessible design should be addressed and communicated so that we are able to increase the overall quality of the final accessible design solutions. Accessibility must be conceived as a higher, more compelling general goal without compromising all the standard goals of building. In other words, the aims of this dissertation are to convince others that a re-newed approach towards accessibility is needed and important, as well as to describe this new understanding by pointing out the main essential concepts concerning accessibility and how to approach them. In addition, the limitations of implementing accessibility in the built environment must be explored as well, because we must acknowledge the fact that everything has impassable boundaries. Hence, this dissertation also focuses on exploring these limits.

1.2 Overall position of the research

The current investigation can be labelled as ‘normative research’, since the target is to not just find out how things are but to define how things should be, and to explore them from diverse points of view. That is, it is not a mere descriptive study, because it aims not only at gathering knowledge but also at improving the current knowledge.

Therefore, the main goal of this dissertation goes beyond describing how accessible environments are; more precisely, it is about defining ‘how accessible environments should be’. In order to reach this definition, it is first necessary to find out how things are at the moment in the academic context. For this, a literature review about accessibility and designing for all theories will be presented in **Chapter 2, STATE OF THE ART: Accessibility in current thinking**. In addition, in the **Annex A. Principles for accessibility (for all) Review**, the essentials of accessible architecture will be simplified and restructured according to the varied existing lists of principles of UD / ID / DfA while at the same time exclusively considering those redacted by renowned institutions concerned with the topic. While in the **Annex B. PRM Surveys**, additional data will be evaluated as a result of the analysis of questionnaires carried out among the pertinent interest group of study: People with Reduced Mobility (PRM). The intention is to

gather opinions among the ultimate beneficiaries of accessible environments, which are often merely barrier-free.

As it will be further reasoned in **Chapter 3, RESEARCH OBJECTIVES & APPROACH**, the main assumption of this dissertation is that, when accessibility enters into the project, the quality of the design declines on most occasions, especially if the beauty and identity of the site are neglected. A great part of the problem lies in the failure to integrate these ‘accessible’ environments properly. They are often segregated and oversized spaces, full of grab bars and other orthopaedic devices. They therefore end up with a clear hospital look and are thus perceived discouragingly. Everyone rejects the idea of ageing and losing their abilities; that is a natural reaction of human beings. Consequently, it is not so rare that able-bodied people do not adopt these so-called accessible solutions, thus they frequently end up being just ‘designs for the disabled’. Furthermore, there is another indirect consequence of how these ‘accessible for the disabled’ environments are designed and equipped: the general society grows distant from PwD as able-bodied people perceive the installations as having nothing to do directly with them.

Hence, this is the reason why the need to empower empathy in design is defended in this dissertation, so that architects understand the diversity of needs as their own, and are thus able to design accessible and inclusive built environments for all. It is necessary to prove the validity of this argument and explore whether and how this situation of ‘designs for the disabled’ can be reversed. For that, in **Chapter 4, CASE STUDY: LOCUS IP**, the effects of addressing accessibility under a more empathic understanding will be analysed by evaluating the conceptual designs proposed by students who took part in an intense academic exercise focused on solving accessibility in historic patrimonial urban environments. A further explanation of this case study will be described next in *1.3. Research material and methodology*. Additionally, a detailed description of the questionnaire launched among the participant students and the resulting general statistics can be found in the **Annex C. LOC/TUS Surveys** attached at the end of this document.

As a result of all the data recorded, the next step is to question the reasons for success or malfunction of current accessible solutions, which will be evaluated in the form of an extensive analysis of the different factors that condition them. The attempt is to identify what are the frequent misunderstandings and problems faced when implementing accessibility in the built environment, and also what are the main tools to adopt in order to reverse and improve the current situation. This will be done in **Chapter 5, FINAL DISCUSSION: The essentials and limitations of accessible design**, where all the conceptual ideas for accessible design –and relating these ideas to theoretical reflections on the theory of architecture– will be organized in three main categories: firstly, reflecting on what are the essentials parameters to always bear in mind for a basic accessibility; secondly, pointing out what are those factors that ensure an emotional wellbeing; and thirdly, exploring if there are and which are the limits when implementing accessibility.

Finally, in **Chapter 6, CONCLUSION: Summary of Universal Accessibility fundamentals**, the final main conclusions drawn from the whole research are defined. It is a summary of the considered essential concepts concerning accessibility, which will be presented as a result of the principal ideas and conclusions arrived at throughout this research. The content will be also organized into three sections, which aim to point out the main goals and outcomes of accessibility. The objective is that accessibility is included and embraced with all normality, and that sustainability and social justice of all design is ensured.

To conclude, a recapitulation of the main ideas and final thoughts will be formulated in **Chapter 7, EPILOGUE**. The aim is to shed some last reflections on the importance of empathy-based design in accessibility thinking, acknowledging its significance and scope, but also recognizing its limitations.

1.3 Research material and methodology

The research material and data is based on the existing literature review, the analysis of questionnaires launched among pertinent interest groups of study and evaluations of conceptual designs, depending on what phase the normative study is. The approach is extensive, since it deals with a variety of viewpoints, such as regulations, design solutions, design attitudes, tacit knowledge, a subjective experience of the built environment, cultural issues and values, among others.

In the first stage, the research is mainly based on recording descriptive data such as the main regulations and accessibility standards, as well as the principal guidelines of UD / ID / DfA and other references alike. In addition, PRM are identified as an interesting group to interrogate and learn from the valuable information they can provide. Although it is necessary to acknowledge that PRM are not the only beneficiaries of accessible design –rather to the contrary, accessible design must be for all– they are indeed the most direct users of accessible places nowadays. For this reason, they have been asked to answer a survey prepared for this purpose. The questionnaires contain descriptive data, i.e., facts like their range of disability, age, sex, or nationality; and normative data, i.e., experiences, attitudes or opinions about the present state of things and how these could be improved.

It is relevant to highlight the fact that “[t]he ideal situation for the researcher is one in which the subject matter is genuinely important or interesting to the respondent” [Routio: online]. Hence, it is worth pointing out that, in this case, the respondents of the survey were very much concerned with the topic and self-motivated to take part in the study and share their ideas. It has been an opportunity for them to have their voices heard, and indeed many of them have expressed their gratitude and, on some occasions, even facilitated their personal data and offered themselves for further consultations in the study. On the other hand, however, that means extra effort for keeping the study objective, since being over-motivated can mean that they are not answering truthfully and trying to somehow influence the results of the study. Finally, the questions addressed were more directed to evaluating PRM experiences, feelings, beliefs and convictions about the theme in question (accessible design) in order to make evident a problem (design for the disabled), rather than to solve it.

In addition, as Strickfaden and Devlieger [2011: 213] criticize, “[i]n studies so far, people without disabilities are the designers and people with disabilities are non-designers”. For this reason it is relevant to note that I am a PRM myself, i.e., I am the researcher and the research subject simultaneously, which allows a phenomenological meditation using my own remembrances and earlier experiences related to the topic. My insight on the subject can be considered reliable, as well as a consequence of my natural intuition and acquired knowledge after more than 15 years of experience as a wheelchair user.

In the second stage of the research, the case study entitled LOCUS IP is the main research material used. It aims at unravelling the essentials of accessibility in architecture, and more particularly, how to communicate them. That is, it explores the results of communicating accessibility concerns, but under a more empathic and inclusive understanding.

LOCUS IP –*Let's Open Cities for Us* Intensive Programme– is an academic activity within the Erasmus framework that I have coordinated for three years (2008-2010), counting on the partnership of 9 European Schools of Architecture. The aim of the programme was to work on the particular conflictive territory of accessibility in heritage protected environments. The study took place under a 2-week intensive format in 4 Iberian and Balearic cities: Tarragona (Spain - 2008), Girona (Spain - 2008), Évora (Portugal - 2009) and Ibiza (Spain - 2010). Participants in each workshop included 4-6 students,

mainly from the 3rd and 4th year of studies, and 1-2 professors from each partner university. The exercise consisted of providing equal access to people, regardless of their different abilities and without considering those with disabilities as ‘special cases’ limited to restricted spaces or with designated alternative itineraries for reaching their destinations, etc. At the same time, the stability of the city’s heritage was respected. Therefore, the research material in this case is the analysis of the proposals made by the students, all of them working towards the common aim of both balancing the right of access for all and of preserving heritage.

The methodology consisted of recreating similar case studies: medium-sized cities with comparable topography and development growth, i.e., analogous mobility problems between the old centre located on top of a hill and the new city below. All of them confronted a highly complex situation: accessibility had to be guaranteed for all, regardless of their different abilities; but, at the same time, the heritage of the city had to be respected. In other words, a problem had to be solved in a scenario where any proposal would face the most controversial opinions. The comparative analysis of the students’ design solutions over the 3 consecutive years that LOCUS IP endured—with its slightly different changes in the content taught and exercise proposal—provided valuable research material to analyse, compare and categorize. The expected results should determine outdated solutions, erroneous ideas generated from misunderstanding the whole issue, new design solutions and innovative approaches.

Additional data is also used in the evaluation of the case study LOCUS IP: the surveys conducted among the participants after taking part in the event. Again, the questionnaires contain descriptive data, i.e., facts like year of studies, age, sex, and nationality; and normative data, i.e., evaluations and opinions about their understanding of accessible architecture prior to and after participating in the workshop. It is necessary to note that this survey has also been answered by LOTUS students in LOTUS – *Let’s Open Tourism for Us* (2011-2013), which was coordinated by the school of architecture in Montpellier (France) ENSAM. This was the academic successor and natural continuation of the previous LOCUS (2008-2010), after reaching the maximum duration of a standardly established three-year IP. Although I was not the direct coordinator of LOTUS IP, I have supported it and participated as a teaching staff member in all 3 workshops held in French territories; specifically in: Sète (2011), Bonifacio (Corsica - 2012) and Saint-Denis (La Réunion - 2013).

1.4 Reliability and general applicability

Taking into account that many observations made in this dissertation are a result of the comments obtained in the surveys launched among PRM on the one hand, and architecture students on the other hand, it must be recognized that part of the conclusions might be relatively subjective, or even not sufficiently consistent. In other words, it is subject to an ‘Inter-Rater or Inter-Observer Reliability’ which, as defined by Trochim [2006: online], serves “to assess the degree to which different raters/observers give consistent estimates of the same phenomenon.”

It is important to note this remark because, on the one hand, the PRM survey launched among disabled associations and social networks was voluntary, and those who participated were anonymous people keen on sharing their experiences and expressing their grievances. It should be noted that some of them were even angry when explaining certain situations; thus their comments can be misinterpreted and in need of some filtering. On the other hand, the questionnaires answered by architecture students were specifically directed at the LOCUS and LOTUS students, but unfortunately not all of them replied. In this sense, it is worth noting that all the surveys were launched during the academic year 2012-13

and, regrettably, not all participants were reached. The problem occurred especially with those students who had already finished their studies (often the participants of the first LOCUS workshops held during 2008-2010). This is because the contact data of many of them was their student mail account, which was no longer operative. What is more, it is also necessary to remark that those who take the time to answer surveys are usually more likely those who are happy (or very unhappy) with the activity being surveyed. Therefore, the reliability of the results must be also questioned in this sense.

Aside from this, it must be admitted the difficulty to attain generalizable knowledge on what people expect from their environments through questionnaires. In addition, although both surveys were conceived as qualitative research and directed to many countries, the fact is that the most significant participation in the PRM surveys came only from Spain and Finland, and in too small numbers to be considered representative (75 Spanish respondents and 22 Finns). Similarly, in the LOC/TUS surveys, out of the total 213 students who participated in any of the workshops, only 75 students were reached through the questionnaires; that is a little more than one third of the participants. Therefore, despite the effort to elaborate a scientific interpretation out of the questionnaires, its relevance has been considered not significant enough, and that is why they have been moved to the annexes of this dissertation. Nevertheless, relevant views have been indeed identified and included in the final discussion of the present PhD.

Concerning the general applicability of the results of this dissertation, they are considered appropriate or relevant since they are addressing questions of equity and not discrimination as a basis of human rights. In relation to their possible applications, it is a matter of introducing this updated understanding in the main foundations of architectural practice: in architecture schools or similar training programmes, and in government institutions that regulate the competence and quality of the built environment. The positive effects of such implementation would rise in a minimum period of time, since we are talking about long-term outcomes. Nevertheless, we must admit that its final applicability is a political question since, despite the growing sympathy towards designing for all, the fact is that it is still considered expensive and not always economically viable in general terms. It is for this reason that, according to this research, the suitability of some accessibility standards should be questioned as well, especially if they are too demanding, which can lead to the opposite of their intended results. That is why it is advised to not be too strict and include concepts of ‘practicability’ or ‘partial accessibility’; that is, to also accept a degree of accessibility, because vast diversity exists within the world of disabilities.

2

State of the Art: Accessibility in current thinking

2.1 Tracing the origin of accessibility

The disability rights movements began strongly in the 1960s in the United States of America (USA), when a process of experimental de-institutionalisation allowed people with severe physical disabilities to begin experiencing independent living [Fleischer and Zames, 2001: 33]. The goal of the disability rights movement, as other similar civil rights movements, was to ensure equal opportunity and to eliminate social discrimination.

To discriminate socially, as generally defined, is to make a distinction between people on the basis of class or category without regard for individual merit, such as skill or personal achievement. That is, it is an action based on prejudice resulting in unfair treatment of people, and examples of social discrimination include many variations such as racial, religious, sexual, disability, height-related, weight-related or age-related discrimination among others. “Unlike other targets of discrimination, for people with disabilities, the details of environmental design are critical” [Steinfeld and Maisel, 2012: loc.675]; idea which contrasts with racial discrimination for instance, whose eradication was partially achieved by removing restrictions on the conditions of use of the built environment –e.g. no more separate accommodations for white and coloured people– but not so much the design. Indeed, the case of disability discrimination is more complex to eradicate in terms of economic expenses, since it is not just a matter of being open-minded and changing the social attitude regarding permission for equal access of certain minority groups, but it entails the removal of architectural barriers so that the built environment actually allows access for all people, regardless of their disabilities. Thus, it not only requires a change in attitude, but also an economic effort and allocation of available resources so that modifying the built environment is possible.

The removal of architectural barriers, thus, is basic for disabled people; but it is necessary to note that it may not be enough for eliminating discrimination: When accessibility is achieved haphazardly by means of secondary entrances and segregated areas for the disabled, a latent discriminatory connotation still exists. In other words, if accessibility is not understood as good quality design for everybody and approached in a comprehensive and inclusive manner forming part of architecture as a whole, then it turns out to be just a ‘design for the disabled’, with specific itineraries, segregated areas and facilities realized for those People with Disabilities (PwD) who are not able to negotiate certain built environments. Many ‘accessible’ solutions can be compared to the ‘separate but equal’ doctrine [see Groves, 1951], which attempted to justify the systemized segregation of coloured people in the USA in the late nineteenth century. Again, although the reasons for this segregated use of the built environment do not exactly grow from the same motivations, we can easily find similarities between the spaces

provided for black people in the early past and the current solutions offered to PwD, as shown in the following illustrations (see Fig.1).

Figure 1: Racial vs. Disability discrimination



Source: Own elaboration, with the collaboration of Daniel Molina

Short after the disability rights movement were set into action, the first *Architectural Barriers Act* (ABA) was redacted by the USA government in 1968 to provide information concerning architectural barriers and technical assistance regarding their removal. Likewise, in 1972, the European Union (EU) passed the *Resolution AP (72)5: On the Planning and Equipment of Buildings with a view to Making Them More Accessible to the Physically Handicapped* [Council of Europe, 1972]. It is worth noting, as Sandhu [2011: 44.5] points out, that the United Kingdom (UK) was a pioneer country on PwD's rights, having enacted already in 1944 the *Disabled Persons (Employment) Act*, or the *Chronically Sick*

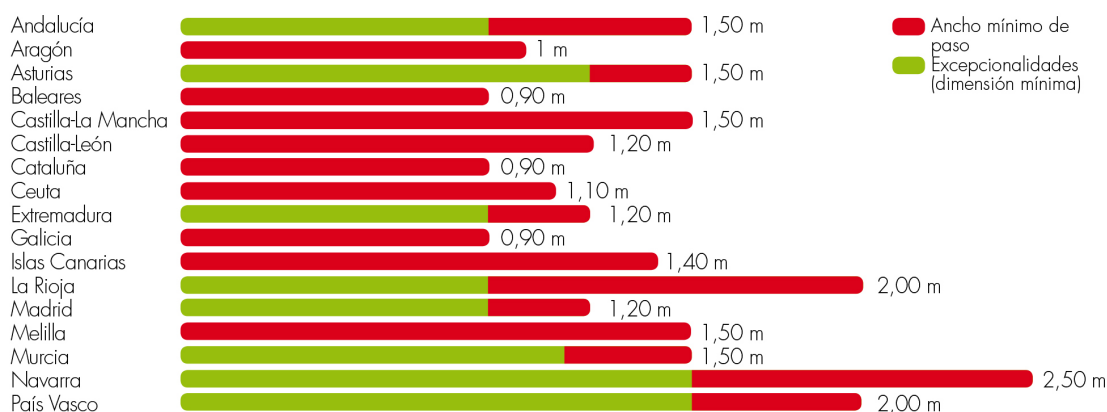
and *Disabled Persons Act* in 1970. Also in the UK, Goldsmith's [1963] pioneering work, *Designing for the Disabled*, cannot be ignored for its great significance in that historical context, being the first publication in the world outlining accessibility guidelines.

The movement for equal rights for PwD continued developing and forcing progress, evolving across all inhabited continents on a worldwide scale. In the decade of the 1990s, the first Disability Acts appeared in several countries, such as the *Americans with Disabilities Act* (ADA) in the USA (1990), the *Disability Discrimination Act* (DDA) in Australia (1992) and the UK (1995), or the *Promotion of Equality and Prevention of Unfair Discrimination Act* (PEPUDA) in South Africa (2000). An evolution of the concept can be observed just by focusing on the words used in the different titles of the acts over the years: from 'disability', to 'discrimination', to 'equality'. This semantic evolution is clearly recognised just by observing how the UK's *Disability Discrimination Act* (1995) was amended to the current *Equality Act* (2010).

Besides, it is worth noting also how these laws protecting the rights for inclusive use and access to the built environment and social facilities have not only been passed in different countries, but also in different regions or states within one country, as is the case of Ontario, a province of Canada, where the *Ontarians with Disabilities Act* (ODA) was put in force in 2002 (and soon evolved to the *Accessibility for Ontarians with Disabilities Act*, enacted in 2005). In fact, similarly events have occurred in many other countries, like in the USA, where the ADA provides guidelines for developing building code requirements for accessibility, although they are not mandatory. While many states have adopted the ADA's guidelines, many others have developed their own standards; thus, professionals working simultaneously in different states must learn the variants, with all the difficulty and confusion that this entails.

In Spain, likewise, each autonomous community has their own standards concerning accessibility, and although they resemble each other more than they diverge, notable differences exist to the point that exhaustive studies on the topic have been published in order to provide better understanding. To illustrate, the following Fig.2 shows how the requirements can differ among the Spanish autonomous communities concerning basic accessibility criteria, such as the minimum clear passage width (in red in Fig.2 below) and the one exception allowed in the case of paths that have isolated obstacles (e.g., a street lamp on the sidewalk), where the minimum clear width can be less (in green Fig.2 below):

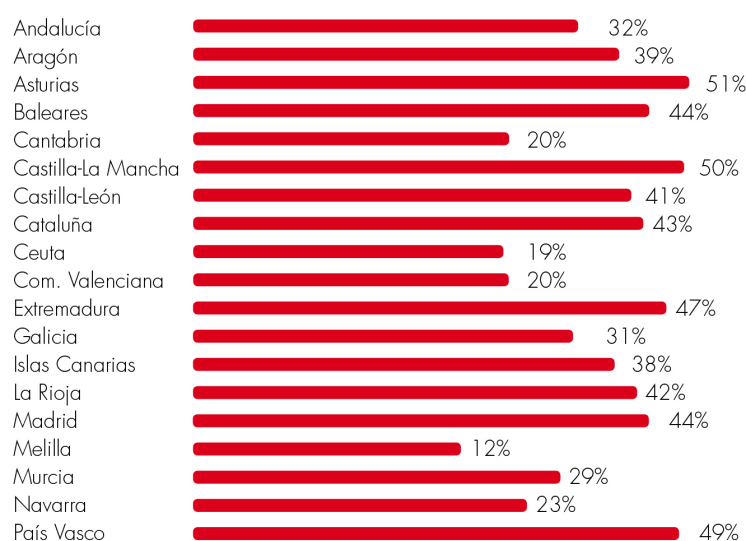
Figure 2: Minimum clear passage width (in red) vs. Exceptional passage width (in green),
[according to Spanish regulations in force until December 2009].



Source: [Alonso López and Pires de Souza, 2010: 33]

Practically all the Spanish autonomous communities developed their accessibility standards in the 1990s, and since then the central government has felt the need for a criteria review and general harmonisation. For this purpose, the Royal Decree 505/2007 was approved in 2007 to legislate the accessibility standards in an equal manner for the whole country. The fact is that nowadays its implementation is still the object of considerable disagreements, and many have requested that it be modified due to the notorious divergences with the regional regulations in force, as Fig.3 below illustrates:

Figure 3: Compatibility percentages between RD 505/2007 and regional regulations [according to Spanish regulations in force until June 2009].



Source: [Alonso López and Pires de Souza, 2010: 41]

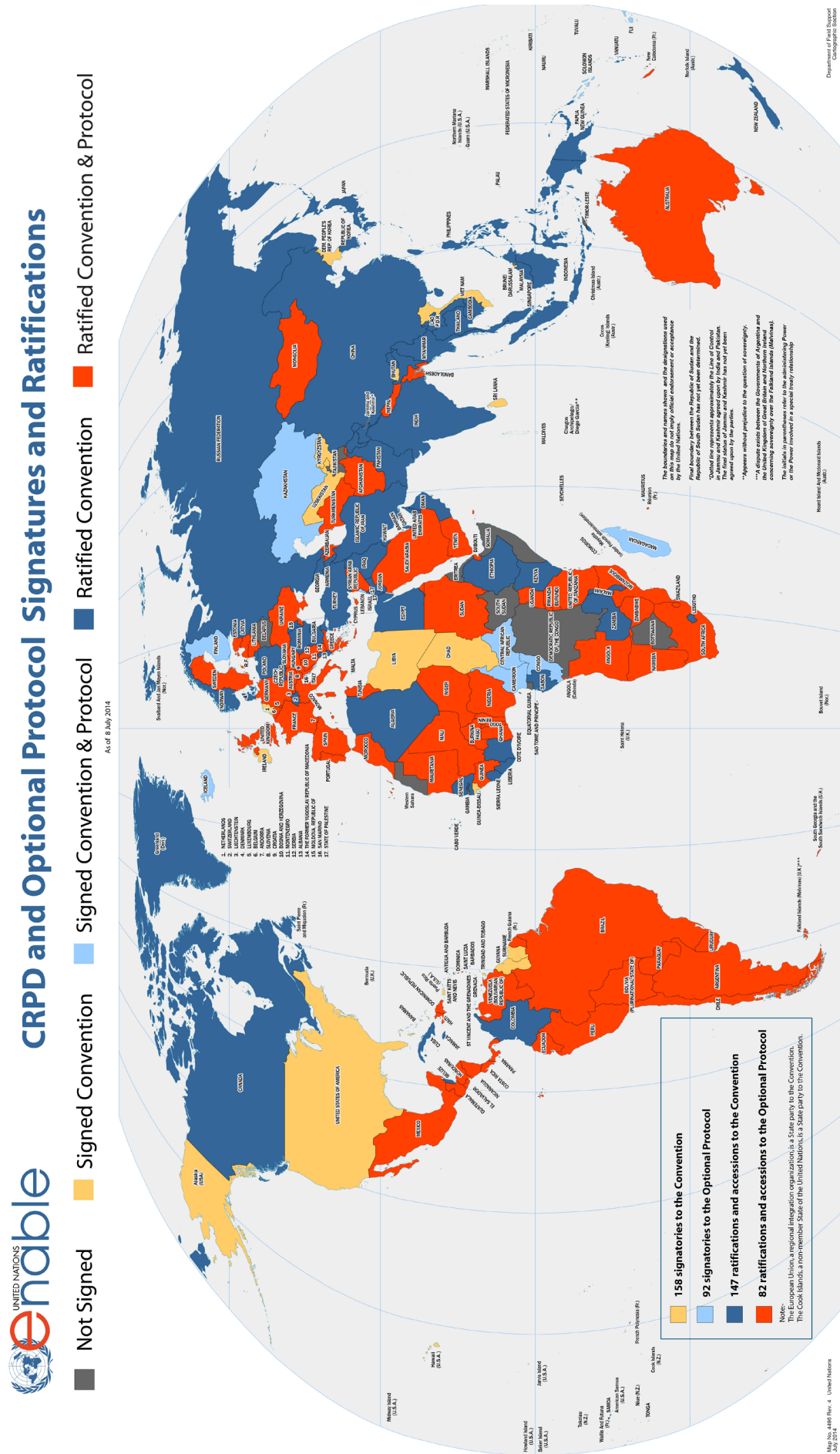
The reality is that, while some countries (or states, provinces or regions within countries) have enacted comprehensive legislation in this regard, many have not. There is a general lack of consensus in this respect, with differing legislations and understanding of the topic. In 1993 the United Nations (hereafter UN) adopted *The Standard Rules on the Equalization of Opportunities for Persons with Disabilities* [UN, 1993], which has provided policy guidelines on promoting the same opportunities to PwD and which have served as model legislation for a number of countries. However, the Rules are not a legally binding instrument, and for this reason the *Convention on the Rights of Persons with Disabilities* (hereafter CRPD) [UN, 2007] was adopted in December 2006 by the UN, with the intention of converting it into enforceable obligations.

The Convention finally came into force on 3rd May 2008, when the 20th State Party ratified it. Since then, many more countries have joined the protocol, and as of December 2010 it was the first Human Rights Treaty to be ratified by a regional integration organisation, the European Union.

“For states that have ratified the convention, it is legally mandatory; for those that have signed, the country has specified an intention to ratify. For the rest, the convention, and the Standard Rules that preceded it, is a normative guide” [Mathiason, 2011: 5.1].

As of July 2014, the convention had 158 signatory countries, of which 147 are State Parties (countries that have ratified the convention); next Fig.4 shows the world ratification status:

Figure 4: UN-CRPD mapamundi



In line with the UN-CRPD, the European Commission (hereafter EC) has decided to put forward a *European Accessibility Act*, which was expected to be published in summer 2013 but has not yet seen the light at the current moment of redaction (October 2013). According to the roadmap –provided for information purposes only and subject to change– published in the EC’s webpage [EC: online], there are already European policies in the areas of disabilities and accessibility concerning the built environment, information and communication technologies (ICT) and transport; but the aim of the *European Accessibility Act* would be precisely to harmonise accessibility requirements in Europe. For a more detailed description, the expected main policy objectives are:

- “Improvement of the functioning of the Internal Market in relation to accessible goods and services in creating economies of scale and remedying market failures;
- The harmonisation of accessibility requirements in Europe addressing barriers across Member States due to diverging legislations;
- Stimulating innovation in the accessibility field through the development and use of European standards;
- Improvement of the effectiveness of accessibility legislation to create an EU level playing field;
- Increase of the incentives in the accessibility markets by increasing public procurement of accessible goods and services;
- Improve availability in the market of accessible goods and services as well as increase competition among industry on accessibility;
- Improve the inclusion and participation of persons with disabilities in the European society and economy.”

In short, the purpose of the *European Accessibility Act* is to complement the legal framework with measures to support the creation of accessible goods and services markets, so that an inclusive society is facilitated. Therefore, the expected *European Accessibility Act* is centred mainly on the market, aiming at moving from 27 separate markets to a functioning single market in such a way that “[c]ommon accessibility requirements at EU level will reduce the burden for industry to comply with multiple national regulations and will improve the offer of accessible goods and services” [EC: online].

The policy analysts at the European Policy Centre, Annikka Ahtonen and Romain Pardo, argue that so far the EU’s legal framework has mainly promoted accessibility as a human right and it has not produced sufficient results; thus this market-oriented approach would be a positive development and is a welcome addition to the traditional legal framework. However, they also warn that “it is important to ensure that they [standards] do not become barriers to innovation: one solution does not always fit all.” The definition of accessibility is advised to be as broad as possible, in order to incorporate an extensive spectrum of the population, and not just target persons with specific disabilities. Also, the definition of accessibility should be ‘user-centred’, which takes into account the views of both developers and end-users. All three warnings –‘one solution does not fit all’, ‘target all population and not only specifically PwD’ and ‘user-centred approach’– are highly significant and will be explored throughout this dissertation. They conclude:

“It should be remembered that while the Accessibility Act can undoubtedly represent a useful instrument to complement the existing legal framework by encouraging commercial interest in accessible goods and services, it is only part of the story, albeit a critical one. In a number of areas, such as access to education and employment, the market approach will not be sufficient to fight discrimination and in such instances, legal obligations and support mechanisms, such as subsidies, are needed.” [Ahtonen and Pardo, 2013: 4]

It is relevant to remark how Ahtonen and Pardo highlight the fact that a uniquely market approach will not be enough to reach inclusion. It is a necessary policy, but it must be well defined and complemented with parallel actions such as a clear policy on suppressing architectural barriers with no segregational solutions. Especially true in third world countries, for instance, access to education is fundamental because if schools are inaccessible, PwD have no opportunity to improve their lives [see Tipple and Coulson, 2003]. What is more, education and cohabitation is also important for the non-disabled

population, because they have to understand that PwD may not need assistance and could instead be independent if the built environment presents the proper conditions to allow access to everyone. It is an interrelated issue: if the built environment is well designed so that PwD can have an autonomous life, society will see that it is fundamental and little by little the general awareness towards PwD will change from pity and charity to acceptance, integration and understanding.

It is a fact, indeed, that for many years and still nowadays, common negative stereotypes and prejudices against PwD can be observed in many parts of the world, with frequently used pejorative language such as ‘crippled’, ‘lame’ or ‘retarded’, as the UN-Enable explain in their *Frequently Asked Questions* (FAQs) section. Instead, the CRPD advocates that “disability should be seen as the result of the interaction between a person and his or her environment. Disability is not something that resides in the individual as the result of some impairment” [UN-Enable (b): online]. Similarly, the World Health Organization (hereafter WHO) published *The International Classification of Functioning, Disability and Health* (commonly referred to as ICF), where the notion of ‘disability’ is observed under a new light that takes into account the social aspects and is not seen only as a medical or biological dysfunction. WHO defines a new conceptual ‘*social model*’ of disability to add to the already known ‘*medical model*’, which views disability as a feature of the person; instead, the social model of disability sees disability as a socially-created problem that is a result of people’s interaction with the environment. Therefore:

“Disability is always an interaction between features of the person and features of the overall context in which the person lives, but some aspects of disability are almost entirely internal to the person, while another aspect is almost entirely external. In other words, both medical and social responses are appropriate to the problems associated with disability; we cannot wholly reject either kind of intervention.” [WHO, 2002: 9]

The fact that this clarification has been necessary is most likely due to the presence of barriers in the built environment that were created by humans themselves, which prevent PwD from developing a normal life and, in turn, implies a wrong social awareness towards disability. That is, due to the lack of physical access and, consequently, the participation of disabled users in the different phases of cohabiting with society—education, employment, leisure, etc.—there is little chance to break prejudices, and PwD are often perceived as distant and strange people. Furthermore, the strange and unknown are always discomforting and frightful, as the Polish sociologist Zygmunt Bauman expounds in *City of fears, city of hopes* [Bauman, 2003].

To sum up, accessibility is not only a right for PwD, but PwD are also a partial consequence of the lack of accessibility, and recognizing the power that environment design has over enabling or disabling a person is fundamental for researching this issue. It is a complex field that requires both technical knowledge and social education. More significantly, it implies an ethical goal for designers. Steinfeld and Maisel [2012: loc.760] summarise in a few lines how the accessibility concept has evolved:

“Despite all the antidiscrimination laws and changes in public policy, examples of significant barriers exist in high-income communities, and the barriers to independence and autonomy in low-income settings are very severe. Social integration, acceptance, and understanding of disability have not yet been achieved in human civilization. There is a typical trajectory in architecture as societies develop more advanced perspectives on disability. The first stage is the architecture of exclusion, usually by neglect. The second one is one of dependence through the development of institutions. The third stage is independence through the development of a legal framework and physical environment that eliminates discrimination and re-moves barriers to independence.”

They conclude by aiming a new stage of development: **“We are now moving toward a new stage in many societies: the architecture of social participation, with the goal of equality in opportunity through universal design.”** Next, we will explore what ‘universal design’ is and how (or if) it differs from our understanding of accessibility.

2.2 Accessibility – one of many terms

As a result of the disability rights movement and all the derivative laws and regulations, a new way of thinking about accessibility has developed over the years. Many terms concerning accessibility have appeared and, although they have slightly different connotations, they are often confused and used as synonyms. Let us explore the related terminology in the field, especially regarding the built environment design, which is the main focus of this dissertation.

The concept of **barrier-free design** emerged worldwide in the 1960s, and it originated primarily to “reduce the barriers to the disabled”, as publicly defended in the international conference organised by the International Society for Rehabilitation of the Disabled, held in Sweden in 1961 [ISRD, 1962]. Elaine Ostroff explains in her co-edited book *Universal Design Handbook*, first published in 2001, that the term **accessibility** replaced the initial idea of reducing barriers to the disabled, focusing more specifically on issues of mobility and wheelchair access instead. She states that in the USA, “*accessible design* became more widely used than *barrier-free design* in the 1970s” [Ostroff, 2011: 1.5].

It is worth mentioning that, in the Scandinavian countries also in the late 60s to early 70s, a concept of **normalisation** was developed, first articulated by Bengt Nirje. As defined by Nirje [1969: online], “the normalization principle means making available to the mentally retarded patterns and conditions of everyday life which are as close as possible to the norms and patterns of the mainstream of society.” One of the major inspirations for the formulation of the principle, as admitted by Nirje himself, was the Danish Bank-Mikkelsen’s pioneering work, which took a significantly humanistic approach that was based on the legal rights of persons with intellectual disabilities [Parmenter, 2001: 276]. “Initially its [normalisation’s] focus was entirely on people with learning disabilities, but in practice it slowly began to include a much broader population”; in fact, “it was a key concept driving design and social policy changes in northern Europe” [Sandhu, 2011: 44.5].

Around 1970, the *International Symbol of Access* (hereafter ISA) was introduced worldwide as an International Standard ISO 7001, and was soon reinforced by the UN. The ISA (see Fig.5) is also known as the *Wheelchair Symbol*, since it is represented by a drawing in white over blue of a person sitting in a wheelchair.

Figure 5: International Symbol of Access (ISA)



Source: [Wikimedia Commons: ISA]

It needs to be noted that, although the ISA is used more often to signal accessible entrances and areas suitable for wheelchair users, it is also used to signal other disability issues, which can be obviously misleading. The accuracy and suitability of this signage has been questioned by several scholars, and also noted for its ubiquitous use throughout the world within just a few decades, regardless of whether accessibility is taken for granted, accepted or modified [Ben-Moshe and Powell, 2007: 489]. Designating spaces as accessible is highly valued, since it denotes good practice, and it is politically

correct in transmitting antidiscrimination and inclusion messages. Thus, this can be the reason why the wheelchair symbol has spread around the globe and can be found in practically every building in the developed world.

The fact is that accessibility is desirable for everyone, because the environments become easier to use. “When we start to introduce accessibility into the community, even at a minimal level, we introduce conditions that seem to be good to everyone” [Steinfeld and Maisel, 2012: loc.796]; providing many examples to illustrate this statement: sidewalks with curb ramps (noting that in Australia they are also commonly called pram curbs), lifts in public buildings (which are ever so welcome if you have low energy or are injured), automatic doors (which, aside from being essential for many PwD, they also benefit parents with baby prams or anybody carrying loads), glass security barriers along the train/metro platform (which are considered primarily to protect the blind but also to prevent other types of accidents and reduce noise levels in the station), among many others.

It is not surprising, then, that the concept of barrier-free, initially aimed exclusively at PwD –most particularly for wheelchair users–, progressively evolved into the idea of **universal design** (hereafter UD) for everyone. A great debt is owed to Ronald L. Mace, who coined the term for the first time in the 80s. Mace, who contracted polio at the age of nine, was a pioneer in the field and –together with his research team at North Carolina State University (USA)– described UD as “the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design” [Connell *et al.*, 1997: online].

It is worth noting that the term ‘universal design’ has been considered controversial in recent times, because it suggests the idea of a single ‘universal solution’ to meet the needs of all people, i.e., the idea that ‘one size fits all’, which can be misleading. Thus, new terminology has appeared to palliate this ambiguity, such as **design for all** (hereafter DfA) or **inclusive design** (hereafter ID). DfA is used more in Europe and Scandinavia, while ID prevails in the UK. Even in the USA –the home of UD– ID and UD are used interchangeably. Although the respective definitions of DfA, ID and UD may vary to some extent, depending on the source, the primary core remains the same: it is about designing for all, regardless of age, ability, or status in life, by means of including the needs of the widest number of consumers under various circumstances.

The fact is that the different terms concerning accessibility –barrier-free design, accessible design, universal design, design for all, or inclusive design– are mostly used as synonyms, albeit they hold somewhat divergent historical and cultural meanings. For instance, in Japan, one of the fastest ageing countries in the world, the dominant terminology concerning accessibility is universal design, which is mainly a response to their massively ageing demographic [see Kose, 2011]. Thus, the Japanese understanding of UD is much closer to the occidental **lifespan design**, **transgenerational design**, **age-friendly design**, or **ageing in place** terminology that refers to design features which support people over their lifespan. “Design for aging is often cited as a major issue in universal design since there is a strong relationship between aging and disability”, as Steinfeld and Maisel [2012: loc.1379] explain.

In Kose’s [2011] article, *The Impact of Aging on Japanese Accessibility Design Standards*, the three required basic criteria prescribed by *The Design Guidelines of Dwellings for the Aging Society* (Ministry of Construction, 1995) are: “(1) floors without level changes, (2) handrails installation when keeping the body balance is crucial, and (3) corridors and door widths that permit assisted wheelchair passage” [Kose, 2011: 11.3]. These requirements address the commonly encountered problems in existing constructions built prior to accessibility regulations; thus, they are basic concepts for barrier-free design, surely described in a similar way in practically all standards for accessibility worldwide.

Hence, chaotic panoply of terms exists which is not so abnormal for a relatively new field. Each varying term aims at more precise definitions and at eliminating certain undesired connotations, which grow mainly on a geographical basis. In the USA for instance, accessibility “was and is still used very much linked to legislative requirements” [Ostroff, 2011: 1.5], which is basically a barrier-free thought exclusively for the disabled. Whereas in the EU, accessibility has a broader understanding and is linked more to a comprehension of universal design that culminates in the design for all determination. Let us briefly review the evolution of the concept of accessibility in European countries:

As a result of a 1987 EC request that aimed at harmonising and standardising the primary general-access measures within Europe, the *European Concept for Accessibility* [Wijk, 1996] was published, supervised by a steering group of experts from different European countries. This group of European experts soon founded the ‘European Concept for Accessibility Network’ (hereafter EuCAN), which continuously publishes updated material on the subject up to the present. In Wijk’s edition, accessibility is defined in terms of UD: “Everyone must be able to use the built environment in an independent and equal way. This is the objective of universal design and the European concept for accessibility” [Wijk, 1996: 25].

In following editions, DfA is used instead to complement the evolutionary definition of the *European Concept for Accessibility* (hereafter ECA):

“This [Design for All] is understood as the intervention in environments, products or services so that everybody is able to participate in the creation of our society, providing him/her with equal opportunities to take part in the economic, social, cultural and leisure activities. (...) In addition, Design for All ensures that future generations enjoy, to the same extent, a favourable environment that is built with everybody in mind (sustainability). Thus, Design for All can be said to be a philosophy and planning strategy whose aim is universal access.” [EuCAN, 2003: 23]

Not only DfA, but more new terms can be observed in EuCAN’s 2003 edition, such as the **people-centred approach**, which occupies a whole chapter addressing questions of ‘human diversity’, ‘lifespan’, ‘quality of life’, and ‘sustainability’. This underscores the principle that “[a]ccessibility is for all citizens and not only for wheelchair users” [EuCAN, 2003: 96].

In the following EuCAN edition, published five years later, DfA developed into a more precise definition:

“For the purposes of this guide, Design for All can be defined as a philosophy and a process for achieving universal access including environments, products and services that are designed in a respectful, safe, healthy, functional, comprehensible and attractive way.” [EuCAN, 2008: 15]

For the first time, the definition was complemented with specific principles – ‘respectful’, ‘safe’, ‘healthy’, ‘functional’, ‘comprehensible’ and ‘attractive’ – that all accessible design should follow. The explanation continues to remind us again that accessibility is not just about providing equal opportunities to people with activity limitations, but to enable ALL people to enjoy equal opportunities to participate in every aspect of society. It is also acknowledged that many other terms have aims that are similar to DfA: “Universal Design (USA, Japan), Inclusive Design (UK), Barrier-Freedom (Germany) or Obstacle-Freedom (Switzerland)” [EuCAN, 2008: 15].

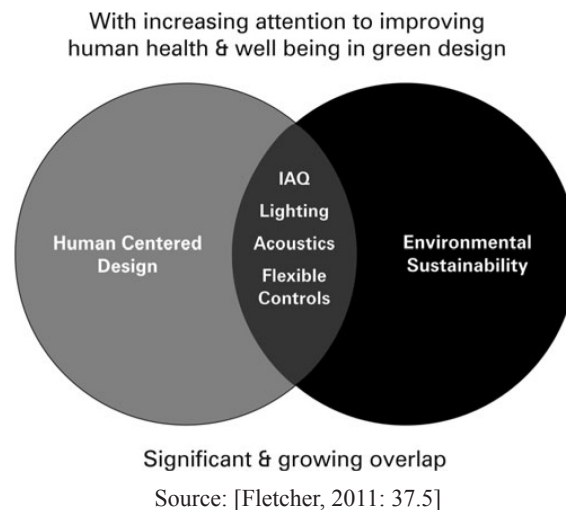
Therefore, there is a visible conflict of coexistent terminology worldwide, and still today we can find institutions who aim to specify a more accurate understanding of accessibility in its broadest sense. For instance, **human centred design** has been the term chosen by the *Institute for Human Centered Design* in Boston (USA), who claims:

“We are invested in the international universal design/design-for-all/inclusive design movement but we believe that it is important to be open to complementary ideas that make sense within the simple and open framework of human centered design. Important parallel trends today include green design and design for health and healing. We see value in finding the common ground between movements and in working collaboratively.” [IHCD, online (a)]

To sum up, we could say that the early concept of barrier-free design has developed gradually and progressively toward more embracing terms, focusing attention not only on PwD but on the needs that are common to us ALL. ‘Inclusiveness’, ‘user-centred design’, ‘design for all’, and many others are terms used to refer to one fairly similar concept: design with everyone in mind, so that nobody feels excluded. If this is achieved, we are looking at long-term designs, able to healthfully support needs that span a whole lifetime, thus, creating sustainable designs that provide quality of life.

At the heart of the matter is finding that which benefits of the largest majority; it is a social concern often called **social sustainability**, since working for people is also environmentally sustainable, as illustrated by Fletcher [2011] in her article on exemplars of universal design. Focusing on human health and wellbeing are definitive qualities of accessible design, but also of sustainable design. The following diagram (see Fig.6) provided by Fletcher [2011: 37.5] shows the overlapping concerns between accessible and sustainable design: indoor air quality (IAQ), lighting, acoustics, and flexible controls.

Figure 6: “Illustration with overlapping circles representing environmental sustainability and universal design”



Therefore, ‘social sustainability’ places UD / ID / DfA under the umbrella of sustainable design, or in the words of the *Institute for Human Centered Design*, UD and green design are two sides of the same coin: “Green design focuses on environmental sustainability, Universal Design on social sustainability” [IHCD, online (b)]. The origins of combining UD with environmentally sustainable design can be dated to the 2004 *Designing for the 21st Century III: An International Conference on Universal Design* in Rio de Janeiro, with Walsh’s keynote presentation, which encouraged including notions of sustainable development when conceiving UD. Walsh denounces the fact that “the concept of Sustainable Development has been hijacked by Environmentalists”, and that the words ‘green’, ‘environmental’, ‘ecological’ and ‘sustainable’ are used more everyday, “but are frequently interchanged without understanding”. A sustainable building is also one “ensuring that it can be safely and conveniently entered and used by ordinary people” [Walsh, online].

However, leaders in the field continue discussing the more appropriate terminology, debating especially whether ‘inclusive’ and ‘universal’ are synonymous or different. Renowned figures who advocate UD in the USA, such as Edward Steinfeld principal investigator for the *Rehabilitation Engineering Research Center on Universal Design* (RERC-UD) at Buffalo University, have acknowledged that the expressions ‘inclusive design’ or ‘design for all’ are more intelligible [Steinfeld and Tauke, 2002: 180], and this has been exemplified clearly in the naming of their research unit *Center for Inclusive Design and Environmental Access* (hereafter IDeA Center). Nevertheless, Steinfeld, in

his last publication, advocates using the term universal design, claiming that it is the best “because it reflects the ideal of providing universal benefits” [Steinfeld and Maisel, 2012: loc.2614], in the same way as using terms like ‘universal suffrage’ or ‘universal healthcare’.

Therefore, when universal is understood in this way, it communicates the ultimate goal of inclusion that all accessible design theories pursue. However, in order to counteract the unrealistic connotations of universal (‘one solution fits all’) and to incorporate the inclusiveness essence of the other terms (ID, DfA), Steinfeld and Maisel [2012: loc.943] have proposed a new and improved UD definition aiming at a new perspective towards sustainable design and active living:

“Universal design is a process that enables and empowers a diverse population by improving human performance, health and wellness, and social participation.

In short, universal design makes life easier, healthier, and friendlier. (...) Thus, universal design should recognize the context in which design takes place rather than imposing an absolute standard to every situation.”

In contrast, Sandhu [2011: 44.4] criticises the notion that UD is an American phenomenon, and claims that the USA has not been the world leader in implementing inclusive design, but is only better at packaging and marketing it. In short, according to Sandhu, UD is the “marketing of a lifestyle”. He explains that the term UD is rarely used in other parts of the world, that it is attractive only to countries such as Japan and Korea, and that it has little impact on emerging giants such as India and China.

This claim can be verified by checking the number of entries obtained when googling ‘universal design china’ / ‘inclusive design china’ / ‘design for all china’, whose results, respectively, are: 36,700,000 / 2,770,000 / 1,030,000,000 (retrieved on November 2013). The same order is obtained when checking the same terminology in relation to India. However, we must acknowledge the fact that these results could change notably if we googled the respective terms after translating them into Chinese and Sanskrit writing. Hence, we could say that, apparently, for both China and India, DfA is clearly more preferred. Surprisingly, in the particular case of India, albeit there is The Design for All Institute of India, they actively promote the adoption of the *Universal Design India Principles* [DfA India: online]. Thus, we find yet again another sign of discrepancies in the terminology used in the field.

Nevertheless, other scholars also defend UD’s prevalence over other terms. For instance, Herwig [2008: 17] argues:

“Three main terms often accompany and sometimes contradict one another: Universal Design, Inclusive Design, and Design for All. They are often supplemented by words such as ergonomics and usability. (...) It is unlikely that all of these terms will survive, however Universal Design is the one with the greatest chance of persevering.”

It is worth noting that Herwig is not American. Likewise, it is also worthwhile to mention that the British Selwyn Goldsmith, who published the aforementioned renowned book *Designing for the Disabled* in 1963, updated it in 1997 with the added subtitle *The new Paradigm*. He published his last book in 2000, titled *Universal Design: a manual of practical guidance for architects*.

On the other hand, *inclusive* is often “interpreted to be broader, to embrace diversity in social and economic circumstances in addition to variation in age and ability” [IHCD, online (b)], thus institutions hesitate considerably when grappling with the choice of one term or another. Even though the preference of terms depends mostly on the region, as previously stated, it seems that UD is the term chosen in general terms. A clear example is the Council of Europe: although Europe in general mainly uses ID or DfA, the Council uses UD in many of its resolutions [see Council of Europe, 2007, 2006 and 2001]. In addition, it is relevant to note that in the *Resolution ResAP(2001)1*, commonly known as the *Tomar Resolution* [Council of Europe, 2001], there is a specific observation concerning the terms ‘design for all’, ‘integral accessibility’, ‘accessible design’, ‘inclusive design’, ‘barrier-free design’, ‘transgenerational design’ and ‘accessibility for all’, which are regarded as converging and, despite their slightly different connotations, are synonyms whose meaning is similar to the term ‘universal design’.

The UN also opts for the term UD in its CRPD [UN, 2006], providing a definition which is completely inspired by the Mace team's first definition but that also clears up the misunderstanding of "without the need for adaptation or specialized design":

"Article 2. Definitions

'Universal design' means the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. 'Universal design' shall not exclude assistive devices for particular groups of persons with disabilities where this is needed."

In addition, a full article concerning accessibility is described:

"Article 9 - Accessibility

1. To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:

- a. Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;
- b. Information, communications and other services, including electronic services and emergency services.

2. States Parties shall also take appropriate measures to:

- a) Develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public;
- b) Ensure that private entities that offer facilities and services which are open or provided to the public take into account all aspects of accessibility for persons with disabilities;
- c) Provide training for stakeholders on accessibility issues facing persons with disabilities;
- d) Provide in buildings and other facilities open to the public signage in Braille and in easy to read and understand forms;
- e) Provide forms of live assistance and intermediaries, including guides, readers and professional sign language interpreters, to facilitate accessibility to buildings and other facilities open to the public;
- f) Promote other appropriate forms of assistance and support to persons with disabilities to ensure their access to information;
- g) Promote access for persons with disabilities to new information and communications technologies and systems, including the Internet;
- h) Promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost."

Hence, 'accessibility' is the broadest term for referring to access to all aspects of life. In other words, it does not only concern the physical environment, which is the most common and obvious when discussing disability issues, but it also concerns information or societal activities and services, as explained by Iwarsson and Ståhl [2003: 59]. They also describe the dimensions of accessibility using the sociological terms 'micro', 'meso' and 'macro' levels:

"At the micro level, accessibility concerns our immediate environment, in physical terms e.g. housing and its close surroundings. Meso level accessibility concerns our neighbourhood such as public outdoor environment and public facilities in the local municipality or city, e.g. public transport, while accessibility issues at macro level encompasses society as a whole, nation- or world-wide. Micro, meso and macro levels can be applied to accessibility to the physical environment, to information, as well as to societal activities and services."

To sum up, the terminology used to describe environment design that it is functional and usable for everyone differs among countries as well as professions. What is more, the terms –*accessibility*, *universal design*, *design for all*, etc.– are frequently used without explicitly stating their meaning in everyday institutional communications, official documents, research reports, or material on the disability movement. In addition, it is relevant to note that for the common population outside of these particular groups, these terms may be understood differently as well. Thus it is pertinent to check the definition of accessibility:

If we look up the definitions provided by *The Oxford English Dictionary* or *The Cambridge Dictionary*, the adjective *accessible* refers to something “able to be reached or entered (place), or easily got”. Providing a variety of examples to illustrate this definition, such as: ‘the town is accessible by bus’ or ‘this room is not accessible to elderly people’. Both dictionaries also define it as something “easily understood or appreciate” or “able to be easily obtained or used”, with examples like ‘Lea Anderson is a choreographer who believes in making dance accessible’ or ‘making learning opportunities more accessible to adults’, respectively. Another accepted meaning applies to a person (especially one in position of authority) who is “friendly and easy to talk to; approachable”. We can observe how all the definitions use the words *able* and/or *easily*; hence, the word *accessible* refers to having the skill or opportunity to do/use something (able), with little or no effort (easily).

The Oxford English Dictionary adds one more meaning to the term *accessible* as something “able to be reached, entered, or used by people who have a disability”, with the following example ‘features such as non-slip floors and accessible entrances’. This is the only defined meaning which directly refers to the *disabled world*. Instead, if we look up the definition in *Wikipedia* –one of the most used dictionaries online– the term *accessible* is redirected automatically to *accessibility*, which is defined as “the degree to which a product, service, or environment is available to as many people as possible (...) Accessibility is often used to focus on people with disabilities or special needs and their right of access” [Wikipedia, retrieved on November 2012].

Therefore, on the one hand, *accessibility* relates strongly to *universal design*, as described earlier, while on the other hand *accessibility* commonly relates to questions about *disability*. In addition, *universal design* –and its siblings ‘inclusive design’, ‘design for all’, etc.– is clearly oriented toward “all people, to the greatest extent possible”, thus not only PwD. Consequently, there is a conflict of meanings which confounds understanding and approaches: the concept of universal design is often confused with accessibility as the design for the disabled. For instance, in *A Dictionary of Architecture and Landscape Architecture* [Curl, 2006], universal design redirects to barrier-free, with the following definition: “Design for those with physical or other disabilities, involving the provision of alternative means of access to steps (e.g. ramps and lifts (elevators) for those with mobility problems). It is also called *universal* or *barrier-free design*.”

To conclude, both *accessibility* and *universal design* are concerned with addressing the needs of ALL people, that is, going beyond those considered to be ‘average’ or ‘typical’ while not being specific and exclusive to PwD. Steinfeld and Maisel [2012: loc.800] denounce the fact that “many writers use the term ‘universal design’ as a substitute for ‘accessible design’ without understanding its significance or how the terms differ. The goal of universal design extends beyond eliminating discrimination toward people with disabilities.” But Steinfeld and Maisel are looking at accessibility here only from the American point of view, which links accessibility to barrier-free standards instead of the broader European conception. In the USA, barrier-free (or accessibility) has been perceived negatively, as a feature prescribed only for use by PwD, while in Europe, the paradigm of accessibility has simply evolved: originally, it was aimed exclusively at PwD and is now (or should be) rightly for everyone. Thus, accessibility and UD can be used interchangeably, at least in European contexts.

In short, **accessibility is an ongoing concept that is constantly evolving on an international level.** Its origins depart from exclusive institutionalized care and move into special needs that pertain more specifically to the private realm, to equality and inclusion in the public domain. **Nowadays, the accessibility (or UD / ID / DfA) approach must include a commitment to environmental sustainability as well.**

2.3 The limitations of the current implementation of accessibility

In the previous section all the most relevant terms concerning accessibility have been reviewed, noting the chaotic situation of overlapping definitions which, on particular occasions, denote confusing meanings. However, the problem does not lie so much in the terminology of the topic, but in its implementation:

Concern for accessibility has grown notably in recent times, manifesting itself in hundreds of worldwide equal rights laws against PwD discrimination, or in the introduction of UD in the teaching and professional context. The building codes that are written to specify accessibility requirements in the built environment are precisely the ones that mislead and cause problems: they are still too exclusively focused on barrier-free design for the disabled, giving instructions on how to design the built environment to be ‘wheelchair friendly’. Lately, they also introduce ‘blind friendly’ tools, but they are not holistically inclusive. Probably for this reason, different specialized universities and institutions have been created in order to promote, complement, assist, and clarify the needs and desires of accessibility.

That is, aside from the respective accessibility standards redacted by each government or local council that results in different Disability Acts or laws promoting equal rights without discrimination, there is much information regarding accessible design in hundreds of web pages coming from public and private institutions concerned with the topic (see *Annex A. Principles for accessibility (for all) Review* for further detail). Therefore, the lack of information cannot take the blame for the poor quality of accessible designs. On the contrary: the enormously excessive number of accessibility guidelines hints at the fact that a clear means for approaching the topic has not been found yet. Therefore, there seems to be a need for alternative, parallel, and additional information.

The fact is that most worldwide accessibility standards demand that buildings be barrier-free for PRM and that they provide some dimensions as guidelines, but they do not approach the topic from the broader understanding of inclusiveness. Partly as consequence, the *International Organization for Standardization* (hereafter ISO) recently published the International Standard entitled *Building construction – Accessibility and usability of the built environment* (ISO/FDIS 21542:2011), which specifies a range of requirements and recommendations regarding accessibility in buildings, although not open public spaces. ISO/FDIS 21542:2011 understands accessibility beyond PwD, although it of course provides instructions on how to build accessibly for them. What is more, it provides information not only for PRM concerns, as is customary in accessibility standards, but it also details the requirements for sensory impairments. It is worth noting that ISO standards are voluntary, albeit they are often adopted in some countries as part of their regulatory framework. On other occasions, they are simply referred to in legislation on a technical basis. This, however, is far from an ideal situation, since ISO standards are available only through payment. Therefore, fulfilling some voluntary guidelines that are obtained only by paying a fee makes it highly unlikely that they will be fulfilled at all.

On this respect, a good and necessary strategy to motivate the implementation of accessibility in its broadest sense (i.e. UD / ID / DfA) would be to grant economic incentives from the government. It would benefit both businesses and final users, since it would mean higher demand and, therefore, more competitive prices. A good example of this way of thinking is Japan, which “may be the only nation that has used economic incentives at the federal level rather than legal enforcement” [Kose, 2011: 11.1]. As mentioned earlier, *The Design Guidelines of Dwellings for the Aging Society* were redacted by the Ministry of Construction in 1995, but they were considered only essential, not mandatory. However, when the Housing Loan Corporation decided to prioritise them, that is, give preference to granting loans to those promoting design for an ageing society (understood as energy-conscious design or highly

durable design), the incentives became notably strong. Kose [2011:11.7] concludes:

“The most difficult part of the introduction of universal design concepts was how to persuade the general public to accept them. An examination of the Japanese accomplishments reveals that it is best when they are introduced into the market with economic incentives. Perhaps the best policy is to combine them with legal enforcement.”

Furthermore, accessibility / UD will be fully accepted when the marketing approaches switch from “handicapped” or “elderly” to “better for everyone” and “planning ahead for your family’s needs” [Mace et al. 1991: online]. In order to do that, it is necessary a change of perspective which can be obtained through education. On this regard, it is worth briefly addressing the Council of Europe, which has a long history in defending the rights of PwD and demanding proper accessibility teaching:

Already in 1977, *Resolution AP (77) 8 on the adaptation of housing and surrounding areas to the needs of disabled persons* was adopted, highlighting within its criteria, the General Principle A.2, which demands teaching accessibility in cooperation with PwD [Council of Europe, 1977: 2]:

“Widening the scope of education and information provided for those engaged in the house-building process to include teaching of the problems outlined above and their possible solution. **The closest co-operation with the disabled would be desirable to this end.**”

In the Council of Europe’s subsequent *Recommendation No. R (92) 6 on a coherent policy for people with disabilities* in 1992, there is a specific article concerning the training of architects in accessibility as basic educational content [Council of Europe, 1992: 25]:

“For the purpose of taking early action to promote a radical and coherent policy for accessibility, **the concept of integrated accessibility should be at the roots of the basic training syllabus for architects, town planners and engineers.**”

This concern for the training of architects eventually led to the adoption of the *Resolution ResAP(2001)1 on the introduction of the principles of Universal Design into the curricula of all occupations working on the built environment* [Council of Europe, 2001], commonly known as the ‘*Tomar Resolution*’, noting that the previous term ‘integrated accessibility’ is now replaced by ‘universal design’ [Council of Europe, 2001: (online) 3. *Aims, objectives, and strategies*]:

“For the purpose of taking early action to promote a coherent policy to improve accessibility, **the concept of universal design should be an integral and compulsory part of the mainstream initial training of all occupations working on the built environment**, at all levels and in all sectors.”

The ‘*Tomar Resolution*’ also specifically recommends curricula to be developed with the cooperation of PwD organisations [Council of Europe, 2001: (online) 8. *User participation*]:

“Curricula should be developed with the co-operation of users across the age span, including people with disabilities. **Curriculum developers should draw on their expertise.** They should be considered as a source of information, first-hand experience and professional competence. **User participation should take place as early as possible.**”

This recommendation is a partial consequence of the low percentage of attendance in higher education, as reported in the *World Report on Disability* [WHO and World Bank, 2011: 205-232]. This fact results in the practically null presence of disabled students and, consequently, teachers and researchers (except for those who developed a disability after having already been on the academic staff). In the architecture context, it is important to note:

On the one hand, as architects, it is highly important to understand that architecture is a mirror of society’s customs and needs. Part of the role of the architect is deciding what cities look like and how we live in them, how buildings are designed and how we inhabit them. Architects must be aware that any decision on a project involves certain results that are gradually transformed into reality and into the habits of society. A lack of precision in the design can cause erroneous social awareness about the capacities of certain people, a fact that regrettably ends in prejudices and discrimination. Indeed, already in the UK’s **Disability Discrimination Act** from 1995 –later amended to the title *Equality Act* in 2010– PwD often identify themselves as a minority group of users with a disadvantage in society

resulting from design discrimination. This inevitably becomes the seed of many other situations of exclusion. Likewise, it is essential to bear in mind ICF's *social model of disability*, which understands disability as a result of people interacting with their environment. That is, an inhospitable environment can make a person feel handicapped: inaccessible surroundings generate despair and impotence in a person with special needs, who feels helpless in such a place.

On the other hand, accessibility regulations, as mentioned above, are often confusing and limited in a merely barrier-free understanding; in other words, they are not approached in a holistically inclusive manner. Steinfeld and Maisel [2012: loc.2075] claim:

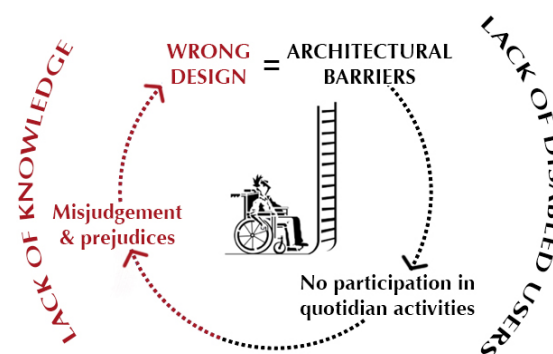
“Regulations do not address many important issues for accessibility beyond this [removing barriers that could be interpreted as discriminatory] (...). For example, few requirements of regulations directly benefit people with mental health conditions or those with cognitive impairments. Adjustable devices, logical controls, easy-to-read instructions or easy to understand building circulation systems are not required.”

The authors also denounce the fact that “many designers interpret regulations to prescribe all that is needed to accommodate people with disabilities. Thus, the resulting benefits are often very limited.” Similarly, Imrie [2004: 283] explains how building regulations are unhelpful for challenging the prejudices of architects towards accessible design: “There are too many get-out clauses and exemptions in law to expect anything other than the continuation of practices which treat accessible design as an ‘add-on’ or part of compensatory design.”

Consequently, if there is a general lack of cohabitation and shared experiences between the architecture professionals and PwD, there is no chance to eliminate prejudices and contrast the assumed information with actual needs. Architecture professionals have no opportunity to benefit from being in direct contact with the target group, thus they have no opportunity to properly build solid knowledge and innovation on the topic and then impart their expertise to others. The general result is often a mediocre design based strictly on regulations, which often does not provide equitable quality and regrettably reinforces the persistence of prejudices and misjudgements.

It becomes an endless vicious circle, as the following diagram aims to describe (see Fig.7): PwD often feel less able (despaired and dependent) due to the presence of architectural barriers, which prevent them from being autonomous and carrying out an active life. The presence of architectural barriers, in turn, is to blame for the prejudices and misjudgements about PwD, since their presence means that PwD cannot normally participate in many everyday social activities without the need for assistance. Indeed, that is the reality perceived by the able-bodied, and thus PwD are set apart from normalcy. In turn, accepting PwD as people in need of assistance, together with the presence of architectural barriers that prevent them from participating in societal life, means there are few opportunities to break assumptions and improve designs. Therefore, architectural barriers tend to prevail, and the endless circle starts all over again.

Figure 7: Schematic diagram of the vicious circle generated by architectural barriers



Source: Own elaboration

The objective must be to promote equally accessible environments so that those with different abilities will not be treated as ‘not normal’, as different from the rest and restricted to segregated areas or special accesses and alternative itineraries for reaching their destinations. We must find quality solutions for everybody equally, and we must be aware that, by truly suppressing architectonic barriers, we will eliminate many negative effects of disabilities. Therefore, it is in part the architecture professionals’ duty to reverse this situation, and an indispensable path is to properly teach students, who are the future architects. Paraphrasing UD&C’s [online] approach, education is better than regulation, since regulations often impose onerous restrictions and stifle creativity, whereas **education empowers and excites people to seek the best possible solutions**. And herein lies the problem to solve: **how can we successfully educate accessibility?**

2.4 Current thinking in the academic environment

Accessibility teaching –understood as UD / ID / DfA– within the Architecture curriculum of European schools has become compulsory in recent years, partly due to recommendations of the Council of Europe’s [2001] ‘*Tomar Resolution*’. Progressively, each state member has redacted its own laws regarding this matter, and practically all European Schools of Architecture claim in their syllabus that such teaching is carried out, but the veracity and quality of such teaching is questioned.

One indirect result of the ‘*Tomar Resolution*’ was the *AAoutils project*, a 2-year project designed to provide teaching tools for professional training in architecture that is accessible to all. In 2002, Kennig and Ryhl published their report, which provided representative cases of varied projects and models for UD teaching, not only among European schools, but worldwide. Among the examples provided, the case of Denmark stands out for providing two opposing examples (dated in 2002) [Kennig and Ryhl, 2002: 14-15]:

Firstly, teaching UD became statutory at schools of design and architecture in 2000 in Denmark. However, the procedures differed notably from one school to another. For instance, School of Architecture at the Royal Danish Academy of Fine Arts, in Copenhagen did not confer any specific focus or attention to UD. The only exception was Prof. Karen Zahle’s personal commitment to the topic. Unfortunately that was not enough, since a seminar on UD organised in spring 2002 had to be cancelled for a lack of sufficient enrolment from the students.

On the other hand, the School of Architecture in Århus has made UD compulsory for the 1st and 2nd years of studies since 1995. The teaching was carried out by Prof. Poul Østergaard, in the form of a 2-day intensive course combining lectures with sensory and mobility impairment simulations together with the participation of external consultants. In this case, students expressed special interest in the topic of accessibility for all and there was also an increase in the number of final examination projects about UD. Nevertheless, professors Zahle and Østergaard retired from both schools of architecture around the same time, coinciding with the preparation of the report. After their retirement, a void in the education was felt in both cases. **This hints at the fact that UD teaching is strongly related to the personal engagement of professors**, and that it is not (or it was not in 2002) naturally taught within the architecture syllabus.

In fact, people who are concerned with accessibility teaching are often people who relate to the topic for personal circumstances. An example of it is Ronald Mace, one of the pioneers in introducing the subject to academic environments and who contracted polio at the age of nine. Similarly, Selwyn

Goldsmith, who published *Designing for the Disabled* already in 1963, also contracted polio when studying architecture. It is not surprising then that if we analyse the contributors of the publication *Universal Design: 17 Ways of Thinking and Teaching* [Christophersen, 2002], many of them also express their personal reasons for being involved in the teaching of accessibility for all.

For instance, Laurie Ringaert, director of the Universal Design Institute at the University of Manitoba (Canada), explains how her father contracted polio shortly after she was born and how she greatly learnt from him and his friends. What is more, she later became a wheelchair user herself due to a fibromyalgia. “Thus I also bring my own user-expert experience”, she notes [Ringaert, 2002: 270]. Likewise, Andrew Walker, founding member of the UK Institute for Inclusive Design, became a wheelchair user when he was already an architect; he had an accident and fell through a roof while measuring a building. [Walker, 2002: 127]. Moreover, Prof. Makoto Yanagisawa, from the School of Design and Architecture at Nagoya City University (Japan), was approaching 70 years of age when he wrote his contribution titled 3.5. *Universal Design Competition for Students 2000 Nagoya /Japan*. Aside from specifying his elderly condition, he also expressed his sincere thanks to the judges of the competition who worked without remuneration [Yanagisawa and Shimizu, 2002: 386]. **One aspect of the customary character of the UD approach is that it seems to be concerned with accessibility out of good will, that it is charitable and in solidarity with the disadvantaged.** And that is a weak and limited approach, as well as a sign that UD is still not part of the mainstream education.

The commitment of educators to UD as it relates to their own personal circumstances is also paralleled by the interest of students who attend their UD courses, as Story [2002: 246] points out when describing her experience in instructing an Internet course on UD: “Some of the students have disabilities or have family members with disabilities; these participants enrich the course for everyone with their personal perspectives on the topic.” That is why it is worth describing initiatives that further engage other students who do not have a close relationship with disabilities. The case of the Helen Hamlyn Centre (HHC) is a good example:

The HHC, at the Royal College of art (RCA) in London (UK) has developed inclusive design education since 1999. It was the successor of the former *DesignAge Program*, which focused on exploring design for ageing populations. The HHC broadened its scope by targeting all members of society, and also by empowering a strong social agenda and user participation. Likewise, the HHC adapted the former *DesignAge Competition* (1992-1999) to a more general design awards scheme under the banner ‘*Design for Our Future Selves*’. That is, the scope was not merely designing for the elderly but also “encompassing how we might live, work, and travel in the future” [Myerson and Lee, 2011, 36.5].

Organising design competitions is a great way to engage students, especially if it is awarded in prize money, as *Design for Our Future Selves Competition* is. Furthermore, the topic of designing for ‘our future selves’, allows an easier empathic connection, because as Steinfeld and Tauke [2002: 177] point out, “[f]ew designers, (who, in the U.S., are mostly white, temporarily able bodied males) personally identify with the interests of people who have disabilities.” Instead, designing with ‘our future selves’ in mind allows us to identify user needs in a more natural way, with less charitable connotations. Furthermore, it also brings to the table other important and attractive subjects related to sustainable design.

Promoting learning through competitions is a smart move, since students tend to seek recognition through these kinds of events. Furthermore, architectural competitions determine trends, as noted by Asmervik [2002: 50]. In this respect, it is worth addressing the Schindler Award, which is a biennial European competition that challenges architecture students to place accessibility and inclusive

environments at the centre of the design philosophy. The great achievement of the Schindler Award is that it not only inspires architecture students, but it more importantly provides financial incentives to architecture schools by awarding the winning student's school a prize that is five times the amount given to the winning student (or group of students). By getting schools to commit and engage, long-term success is assured because entire classrooms of students will participate rather than sporadic individuals who concern themselves with the subject, probably for personal reasons. Furthermore, generations of students will take part in the competition every two years, guaranteeing that lectures, seminars or workshops on the topic of accessibility are offered to the scholars, as the Schindler Award rules demand.

Another way for UD to achieve recognition, apart from official competitions such as the one described above, is by stimulating collaborations between universities and enterprises. Again, it is worth mentioning HHC's focus on industry partnerships, since the HHC "has also actively sought to commercialize its research, regularly linking up the college's business network, InnovationRCA, to effect real-world change." [Myerson and Lee, 2011, 36.11] Thus, thanks to interactions with students, graduates, and professionals, a strong, practical linkage with industry has been developed.

Having strong contacts with industry brings a perception of reality to the students, since their projects can be implemented as real solutions and they can better understand the work processes of the industry. For the industry, working in turn with UD in mind increases the interest for long-term commercial benefits. In AAoutils' report, an example of this kind of collaboration between universities and enterprises is also described.

The department of Industrial Design at Tama Art University (Japan) carried out a 4-year pilot project in partnership with the Japanese multinational provider of information technology, the NEC Corporation, during the years 1996-2000. The project attempted to understand the target user group as much as possible through disability simulation experiences and by directly involving PwD [Kennig and Ryhl, 2002: 23-24]:

"Hearings with older people and disabled people were arranged and through interviews, user observations and on site registrations of the users, the students gained an insight in the current problems of everyday life for the user group as well as an increased understanding of their wishes and thoughts. (...) This part of the project constituted almost 50 % of the students' work and was considered the most important part of the project and basic for the further planning of the conceptual work."

In this case, industry's interest in becoming more involved in accessibility research was a consequence of the notable ageing of the Japanese population. Likewise in Greece, an increased commitment to accessibility learning was also noted among professionals in the public and private sectors. However, on this occasion it was a consequence of Greece's preparations for the 2004 Olympic and Paralympic Games, as it was promoted especially by the Ministry of Environment [Kennig and Ryhl, 2002: 18-20].

Whether or not accessibility teaching is promoted by engaged professors, by stimulating competitions and through industry partnerships, the fact is that it is still not normalised in architecture education. This can be easily corroborated when checking the course descriptions available online from many Schools of Architecture; on rare occasions you find courses on UD. Indeed, according to Steinfeld and Maisel [2012: loc.2191], only a few architecture program websites mention a specific course on accessibility or UD in the USA. A similar observation is noted by Elaine Ostroff [2003a: 353] when summarising the status of design education strategies worldwide: although new programmes are developing around the world, they have not been fully institutionalised. There is a perception of change in the air, but a UD education for an inclusive society is still largely dependent upon individuals.

Ostroff has vast experience with the topic, since she developed the Universal Design Education Project (UDEP) in 1989. UDEP started as an American network of teachers with the commitment to infuse UD into the curriculum of design disciplines, specifically in architecture, industrial design,

interior design, landscape architecture, and urban planning. One of UDEP's requirements was to specifically involve PwD in the teaching and learning process, but the several schools taking part in the project were free to design their own approaches, allowing each of them to explore different ways to engage students. The first UDEP pilot project, with the participation of 22 schools across the USA, was carried out in the academic year 1993-94, and its outcomes are well documented in *Strategies for Teaching Universal Design* [Welch, 1995].

Most of the schools participating in UDEP taught accessibility in the form of special seminars, conferences, workshops, specific term courses or online learning modules; but they hardly integrated it into the mainstream architecture curricula. Kennig and Ryhl [2002: 35] evaluate the pros and cons of such an approach:

“The general experience in the USA seems to be that the concentrated workshop as a one-time course works positively, as it generates focus on the problem and easily can be integrated in an already existing teaching programme. On the other hand, the drawback is that the subject field is maintained as separated from and specific in relation to other subjects, when the issues are not naturally integrated in the already existing teaching programme in line with other aspects such as aesthetics and technology.”

Ostroff [2003a: 350] agrees when addressing the UD education status in the American context: “Overall, the United States is still in the early stages of the process to bring universal design into mainstream design education.” It is worth mentioning that Ostroff, together with the CUD (NCSU) and IDeA Center (UB), are currently running the *Universal Design Education* website, which targets both teachers and learners. It also provides several examples of UD teaching worldwide, including instruction materials, content resources, classic UD writings, relevant bibliographies and links on the subject. The purpose of the site is also to offer a place for interaction between educators, with the final goal of building a community of learners who can cooperate and exchange information [UDE: online].

On the other hand, some detractors of teaching UD in the form of specific courses or seminars argue that it should ideally be integrated in all courses, since accessibility has a multidisciplinary and transversal character. Also, they believe that it must be viewed from different perspectives that will frame architectural education. That is why the University of Diepenbeek (Belgium), for instance, developed a ‘Universal Design Curriculum’ to be integrated into the 5-year architectural education programme. It was developed with the special support of Prof. Hubert Froyen under the belief that UD “should not be taught as a separate course in the graduate program since this would be against the principles of an integral and inclusive approach. UD should be rather part of all relevant courses and assignments” [Kennig and Ryhl, 2002: 9-10].

Likewise, Ruth Morrow—coordinator of the professional network *Special Interest Group on Inclusive Design* (SIG) at University of Sheffield (England)—and her colleagues conceived the *DraWare Project* as a 2-year funded pedagogical research project seeking to imbed UD across all 5 years of the Bachelor of Architecture programme. The project was carried out between 1998-2000, and it consisted of conducting specific lectures and seminars on designing for all, inclusion, bodily movement, perception, etc. The concepts were imbedded within different subjects such as ‘Ecology of Architecture’ or ‘Theory and History of Architecture’, as well as projects by several Design Studios working with UD in mind [Morrow, 2001: online]. As reported by Kennig and Ryhl [2002: 22]:

“The findings of the project also showed that it would take time before the concept becomes a natural part of the consciousness of both students and teachers, and the advocates of the subject must necessarily, on an ongoing basis, be critical as to where and how Universal Design is included as a natural factor in existing teaching.”

Although a decade has passed since the redaction of these publications [Kennig and Ryhl, 2002; Ostroff, 2003a; Christophersen, 2002], the full normalisation of accessibility teaching has not yet been achieved. Perhaps an exception lies in the Scandinavian countries, where according to Steinfeld and Maisel [2012:

loc.2195] design educators have evidenced a greater general awareness of universal design than in other regions of the world. Indeed, when we look again at *Universal Design: 17 Ways of Thinking and Teaching* [Christophersen, 2002], that from the publication's three main blocks (1: *Europe*, 2: *North America*, and 3: *Asia and Australia*), all of the contents from part 1: *Europe* are from northern countries, specifically: Norway, England, Holland, and Denmark.

It is worth addressing the Norwegian project *Husbankens Utdanningsprosjekt*, carried out from 1997-2002, and originally inspired in the American UDEP [Christophersen, 2002; Ostroff, 2003a: 343; Kennig and Ryhl, 2002: 25-27; Bringa, Lund and Ringard, 2011]: It was a 4-year pilot project with an integral approach that focused not only on introducing accessibility teaching to universities but also on addressing the general lack of awareness and/or correct formulation of user needs. The project was launched by the Norwegian government with the aim of introducing better methods and outreach for user participation in education, policy and master planning.

The pilot counted on the participation of several universities around the country and covered different disciplines (architecture, interior and industrial design, occupational therapy, engineering, planning and vocational schools). The leading PwD representative organisations also participated, as well as professional experts on UD. The objective was to establish contact between both parties under the coordination of the Norwegian State Housing Bank, in order to find and test new models of collaboration so that a greater understanding of the different user needs could be integrated into the academic courses. The knowledge to be imparted included relevant health education, technological and design education.

The objectives of the project were based on the idea of integration and intended to alter attitudes and prepare teaching material for product development, planning and building design. Ideally, the schools and universities should be able to develop sufficient know-how to carry out courses in UD, thanks to established collaborations, which should be included in the school curricula by the end of the project. According to Kennig and Ryhl [2002: 26], not all participating institutes succeeded in integrating UD as a compulsory part of the curriculum after completion of the project, but some did.

To sum up, the fundamental importance of education must be recognised if we aim at successfully introducing accessibility in a quality manner to our built environment, products and services. Students must be taught in inclusive design, but **educating the educators is also necessary since it is a relatively new field and not all teaching staff members possess the knowledge necessary**. This fact is already true for many of the countries described in the literature review, but it becomes especially more obvious in less developed countries where accessibility and disability issues are not so well integrated into mainstream society.

A clear example of this is provided by Whybrow *et al.* [2010], who address the current experiences of Malaysia, India, and Sri Lanka in moving towards a more accessible built environment. The authors argue that perceptions toward disability and ageing in such countries are notably different from developed nations. Furthermore, their local assistive technologies, materials, standards and construction practices also differ. Thus, implementing western accessibility regulations in this context becomes considerably difficult, so much that the subject requires ingenuity. For starters, these countries have few experts in this field, so the first step is to educate the educators, like the Malaysian government did with its initiative to 'train-the-trainers' in order to capacitate each of the country's architecture schools.

In contrast, Steinfeld and Maisel [2012: loc.292] told an interesting story in their recently published book *Universal Design: Creating Inclusive Environments*. While writing the book, they were also carrying out an educational project to embed UD ideas into design school curricula. The project

involved visiting schools and discussing how to do it with the faculty board. On one occasion:

“One of the faculty members we consulted with listened a while and a look of awakening appeared on her face. She said, ‘We are already doing this! We just don’t call it that’. And it was true. As we speak the world is changing and we change to adapt to it.”

This anecdote illustrates how a greater understanding of accessibility –which is based on ideas of usefulness, sustainability, durability, etc– is already becoming more and more embraced, at least in the majority of developed countries. What is necessary now is an uncoupling of how we understand accessibility from the mere idea of designing for the disabled, because that is the main constraint: sympathy with the disabled is relatively easier, but a genuine empathic attitude is harder to achieve. Empathy means deeply understanding another person’s condition from their perspective, and that might emerge more naturally if we really comprehend accessibility as design for all of us, for our future selves, for future generations.

This dissertation defends the importance of empathy as a fundamental milestone for the development of equitable and inclusive built environments and societies, and it will be explored in detail in chapter 3. *RESEARCH OBJECTIVE & APPROACH.*

3

Research objectives
& approach

3.1 Exploring the failure of accessible design

This dissertation claims that when the demand for accessibility enters into the project, on most occasions, the design paradigm changes: the quality of design declines and some design goals are neglected, such as beauty or affordability.

There is a general *lack of equality in accessible solutions*: Accessible designs are frequently not conceived to include the general population, but are exclusively meant for disabled users; it is only necessary to see the high presence of signage for alternative routes and rooms for the wheelchair user. This lack of an integral approach often results in higher expenses, segregated spaces of mostly poor aesthetic quality, dimensions out of proportion, and sometimes clinical-looking spaces full of orthopaedic devices. In fact, one notable reason for the failure of accessible design, indeed, is that it is often not understood to be design, as such. To design implies an aesthetic care. Or, at least it should. If not, it is just a tool but it is not design. Hence, if accessibility is considered under a merely functional conception, solely as tools and assistive devices but not as designed elements integrated within the built environment, then accessibility is simply excluded from the world of architectural design.

Aside from this, there is also a general *lack of multisensory conception*: Since accessible environments are often merely understood as barrier-free environments (i.e., only meant for wheelchair-users and other PRM), the needs of the people with differing sensorial impairments are not properly approached and met in architectural design. For instance, for people with low vision it is fundamental to have contrasted colours or materials with different textures in the built environment, to provide them with tools to navigate the space. Or, for people with hearing problems, the acoustic harshness of a large and practically empty room is fundamentally different from the softened sound of a furnished space with multiple surfaces which absorb the background noise. Therefore, the design of the built environment must go beyond form and function, but special attention to the perception of our surroundings must also be paid. In order to do that, all senses must be taken into consideration since they become decisive in fully connecting with our built environment; e.g., a rich utilisation of different building materials, with their significant variations in warmth, texture, colour, smell, etc. are essential for providing a holistic perception, which is important to everyone, but especially to those affected by a sensory impairment.

Why these failures occur is probably caused by the difficulty in easily, and comprehensively, understanding accessibility requirements. In fact, this research aims to point out the need for interpreting the accessibility codes beyond the mere specification of dimensions; to prove that the reason for the requirements' demand must be understood in order to guarantee a fully comfortable and pleasant design which everyone is keen to use.

Different factors are identified as obstacles for practicing high quality accessibility:

- **Problematic of excessive information:**

As stated earlier, we can find different accessibility regulations depending on what country, or even which state or region in which they have to be implemented. The immediate impression is that this situation makes little sense. Why should PwD be able to climb a ramp more or less steep depending on their city of residence? Or is accessibility a cultural issue and thus it is just natural that different people in different places see it differently?

One only needs to see the excessive number of existing regulations and good practice manuals, the different demands among diverse countries, or the incommensurate number of Google results found when looking for ‘accessibility’. Aside from this, it is worth pointing out that ‘accessibility’ is a broadly used term, especially on websites. So it is important to not be misled, e.g., Wikipedia refers to it as ‘Web Accessibility’, while accessibility in architecture –the concept discussed in this thesis– is often linked to ‘Universal Design’, as also suggested by Wikipedia.

Aside from the large number of existing regulations, we must also note the constant update of them: every time they are more demanding and require larger spaces and more specifications. Thus, many questions arise: Are accessibility codes reaching their goal and being fulfilled or, on the contrary, are they working in the wrong direction and thinking only of technical details and neglecting architecture in its totality? Therefore, do architects and/or regulations understand the disabilities and their special needs? Is there a lack of comprehension (and exaggeration) of the requirements? Many accessibility codes include samples of technical solutions and, probably due to ignoring the why and wherefore of the demands, architects tend to just simply attach the given solution as a fixed stamp, not daring to make modifications for fear of the frightful consequences.

What is more, “[a]nother significant barrier to existing information use is access to design relevant information presented in a design relevant manner” [McGinley and Dong, 2011: 189]. Existing research on industrial design acknowledges that designers tend to ask “for ‘nuggets’ of information (short pieces of text) that can be easily digested” in the form of graphics and minimal text [Lofthouse, 2006: 5]. Steinfeld and Maisel [2012: loc.2570] similarly assert: “Designers also do not want to read lengthy scientific articles; they want their information in bits that are both easy to find and easy to use.” This particularity of industrial designers can be easily extrapolated to architects when they have to interpret the regulations: they end up saturated by the excess of information, which is not presented in an intuitive, immediate and easily comprehensible way.

In addition, as a result of the use of new technologies and assisted drawing, the attention and precision necessary for hand-drawing has been supplanted by the rapidity and immediacy offered by CAD software. Without going too deep into this question and how it affects architectural design, there is one related automatic consequence of using CAD software instead of hand-drawing: the possibility of inserting a ‘block’ from a CAD library; especially all the blocks related with accessibility. Hence, as a consequence of these combined factors –the incomprehension (and boredom) of accessibility codes, added to the easiness and immediacy of inserting a CAD block and not thinking further about it– accessibility often results in a ‘copy-paste’ of the sample provided in the regulations. It is only necessary to take a look at the designs of a same generation of architecture students, all of them oddly having the same wheelchair-user inhabiting their designs and, more significantly, the same accessible toilet layout. Indeed, it is especially evident in the case of accessible toilets, where we can observe how often they function as an independent object with a complete lack of relationship to their surroundings.

One clear example to illustrate this argument is the Kiasma Museum in Helsinki, designed by Steven Holl. As the reader can see in Fig.8, the museum presents a high design quality of the architectural space (upper images below), and even the restroom design has been cared for, with indirect lights and elegant materials (middle images and bottom image on the left below). Instead, the toilet for the disabled presents a completely disconnected design, segregated from the other restrooms, coldly illuminated and made with dull materials (bottom image on the right below).

Figure 8: Kiasma Museum, Helsinki, Finland.

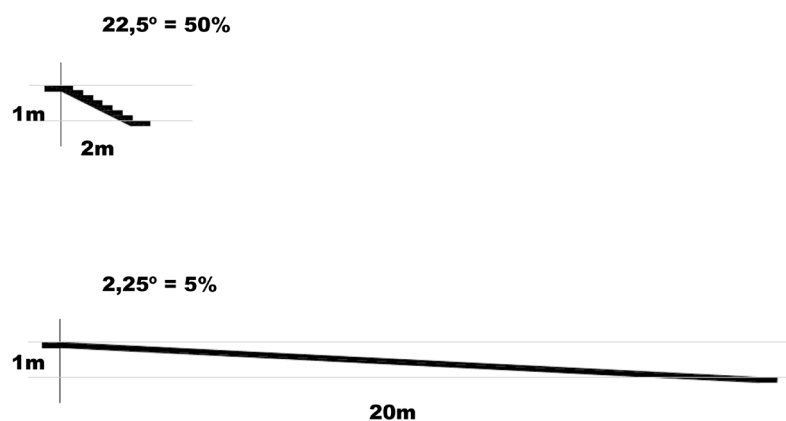


Source: Upper images [Wikimedia Commons: Kiasma]; middle and bottom images [Own material]

• **Problematic of low concern:**

What is more, as this previous example hints, accessibility concerns are often left for the end. Accessibility is rarely approached *a priori*, from the very beginning of the project and conceived as a challenge to solve, but as something the architect has to accomplish at some point, just like the fire extinguishers are placed before the opening of a public building to comply with fire regulations. Consequently, if accessibility is not conceived *a priori* but solved *a posteriori*, the results are often isolated ‘pieces of accessibility’ detached from their surroundings. Furthermore, unexpected extra space and/or installation of devices are very often necessary for solving the architectural barriers that are not forecasted. Indeed, it is important to consider the large quantity of unexpected space necessary when trying to convert something inaccessible into a barrier-free design afterwards, e.g., when aiming to convert a few steps at the main entrance of a building into an accessible ramp, let us say a 1m height difference. Supposing that the stairs occupy 2m on a floor plan ($22,5^\circ = 50\%$ slope), we would need 20m of the floor plan in order to transform it into an accessible ramp (5% slope). That means that the length of space on the floor plan becomes ten times more when transforming stairs into a ramp, i.e., when transforming from inaccessible to accessible. And ‘ten times more’ is a remarkably relevant increase in allotted space, as the following Fig.9 illustrates:

Figure 9: Comparison of occupied space on floor plan: the length of a ramp vs. stairs becomes ‘ten times more’ when covering the same height gap.



Source: Own elaboration

Hence, if such substantial extra space is needed when converting a few steps into barrier-free, it is not rare to find so many back entrances for ‘wheelchair access’ as an alternative to the main, non-accessible entrance to many buildings, since there is probably not enough space in the front to build such long ramp. Or, it could simply be that the architect does not want to have an endless, ugly ramp in front of the building.

In conclusion, accessibility (or universal design, inclusive design, etc.) must be approached more broadly than by just merely complying with regulations, but must be understood as an integrated part of the architectural design. If we do not so, if we leave accessible requirements until the end as mere details to add at some point of the architectural design process, the results are often poor, lacking unity with the whole, and with an incipient sense of discrimination. As seen before, a general lack of aesthetic-empathy is evident when implementing accessibility requirements: the designs are ugly, out of proportion and clinical-looking, among others, aside from the fact that sensory impaired people are almost completely forgotten in the discussion. The most likely reason for this is because accessibility codes are mainly focused on a barrier-free environment and are aimed more at mobility-impaired people

than at people with sensory impairments. Also, accessibility regulations address specific dimensions and technical details rather than the more existential aspects of how human beings perceive and experience architecture. In fact, accessibility cannot be designed successfully without a basic understanding of diversity; that is why it is also called ‘design for all’. Knowing the diversity of people with differing needs is fundamental, and that is indeed not properly explained in regulations.

Furthermore, a good accessible design must involve good functionality and aesthetic quality in equal proportions. The former is indispensable for the very nature of accessibility; it must be usable in whatever task is necessary. The latter is fundamental if we aim to achieve sustainable designs, because it will be the safest way to enhance long-term product/environment relationships and to inspire a deeper attachment. Through doing this, it will postpone product/environment replacement. A positive use experience leads to deeper product satisfaction, thus enabling a product’s long-term use [Mugge *et al.*, 2005]. What is more, the concept of attractiveness is fundamental if we want to ensure that accessible designs are used by the whole population, who will reject using ‘ugly and clinical looking’ environments if they do not absolutely need to. If we succeed in designing equally functional and aesthetic designs, we will achieve sustainable designs, since the former guarantees that all the possible conditions of the human being (all the different phases of one’s life) are embraced, while the latter ensures higher acceptance and co-habitation.

Then, the upcoming question is: Can this actually be specified in regulations? Or are we talking about abstract concepts, such as aesthetics, emotions and wellbeing, which cannot be delimited in building codes, but must be taught in schools of architecture? Ergo the aim and structure of this research: how to approach accessibility in an educational context to reverse the situation, not just to achieve ‘designs for the disabled’ but real inclusive designs. Because architects must always remember that people (with the possibility of choice) will only accept, use and live in environments that are not only functional, but are pleasant and comforting as well. Hence, it is about determining what questions must be faced and what procedures must be followed in order to reach an inclusive built environment broadly accepted and used by everyone while at the same time providing a sense of wellbeing and good quality of life.

The premise of this dissertation is that an empathic approach is necessary to design an accessible built environment that goes beyond the regular barrier-free requirements, beyond functionality and usability concerns. Empathy is essential to satisfy the ‘supra-functional needs’, those social, emotional, spiritual, aspirational and cultural aspects that are equally relevant to us. Herein lies the real pleasure, the sense of wellbeing and perception of a good life. Empathy is the key and starting point to defeat the ‘design for the disabled’ and succeed in an inclusive architecture.

3.2 The need for empathy in designing for all

“Teaching empathy? A skeptic might wonder if it makes any difference. Can’t we assume that empathy will emerge automatically, as part of the developmental process? After all, even babies show signs of empathy.”

[Dewar, 2009: online]

The capacity for empathy is innate. Several studies address how it naturally blossoms as new-borns grow up [Zhan-Wexler *et al.*, 1992; Hoffman, 2000; Sagi and Hoffman, 1976]. Furthermore, it is not exclusive to humans. Other researchers have demonstrated how chimpanzees and other primates [Masserman *et al.*, 1964; de Waal, 1997; Thierry and Anderson, 1986], dolphins and whales [Connor

and Norris, 1982; Caldwell and Caldwell, 1966], elephants [Hamilton-Douglas *et al.*, 2006; Plotnik *et al.*, 2006], or even mice [Langford *et al.*, 2006; Church, 1959] and pigeons [Watanabe and Ono, 1986], can behave in an empathetic manner. Nevertheless, there is also evidence that empathic concerns in human beings are heavily influenced by experience and social beliefs. Empathy is most likely to emerge among people sharing similarities or experiencing similar circumstances [Levenson and Ruef, 1992; Hoffman, 2000]; for this reason, it is not superfluous at all to teach empathy, to practice exercises to trigger it when dealing with people that are not so alike, so that learning to be more responsive and receptive to all humankind can be achieved.

Human empathy is also regarded by many as the basis of moral behaviour and development of conscience. The 18th century philosopher Adam Smith examined the moral thinking of his time in *The Theory of Moral Sentiments* [Smith, 1759], proposing a theory of sympathy and explaining how the pleasure of mutual sympathy, such as the imaginative capacity to place ourselves in someone else's situation, helps to develop conscience that arises from social relationships. Smith's understanding of sympathy is more close to what we consider empathy nowadays. In fact, as pointed out by O'Malley [1999: 23], both words share intertwined roots: "Empathy, sympathy, compassion. Different words, but made up of similar parts. Em-, sym-, and com- are Greek and Latin roots meaning 'with'. Path and passion mean 'suffer'. So all three words mean 'to suffer with'." Holt [2011: 155] provides further explanation for their difference in meaning: "empathy understood as a 'feeling-as', not a 'feeling-for', or even a 'feeling-with' (sympathy)." Therefore, empathy entails a different connotation because it implies a deeper connection than sympathy: empathy is to feel-as-the-other-feels, while sympathy is more close to being aware of another's person's plight.

In a study carried out by McDonagh *et al.* [2009], able-bodied students and students with disabilities in a multicultural context (American, Korean and Chinese participants) were working together to explore relevant design for PwD and they encountered communication challenges caused by the cultural diversity. The participants shared their views on the project-based vocabulary in order to arrive at agreed definitions: they understood "sympathy as 'seeing the disability first before the person' and empathy as 'seeing the person first before the disability'." Moreover, when trying to use "the word compassion which in English means having a deep feeling of sympathy", they discovered that the "Asian translations of this word have negative connotations, implying feeling sorry for the person" [McDonagh *et al.*, 2009: 310]. Therefore, 'empathy' implies comprehension, experience; whereas 'sympathy' (or 'compassion', with slightly differences in meaning depending on the languages) involves awareness and providing comfort, which is somehow more linked to consolation than overcoming difficulty.

If we try to trace back the origin of 'empathy' –although the sentiment is innate– the truth is that the word 'empathy' is only a century old, a result of translating the German word *Einfühlung* (meaning 'in-feeling' or 'feeling into'), whose first use dates back to 1873, when it was coined by the German psychologist Robert Vischer in his doctoral thesis on aesthetics. Edward Titchener translated the German term into 'empathy' in 1909, but the world-renowned father of the term is Theodor Lipps, one of the most influential philosophers of his time. For Lipps, 'empathy' goes beyond psychological aesthetic theories; "[h]is work transformed empathy from a concept of philosophical aesthetics into a central category of the philosophy of the social and human sciences" [Stanford Encyclopedia of Philosophy: online]. Sigmund Freud, a knowledgeable admirer of Lipps for 40 years, transferred the concept into the field of psychology, regarding empathy "as essential for establishing the rapport between patient and analyst that makes interpretation possible" [Pigman, 1995: 237]. Once empathy entered psychology and psychiatry, it was also used to identify different pathologies; e.g., the lack of empathy or presence

of callousness are primary psychopathic traits, which most likely triggers off many other psychopathic traits such as a lack of guilt and pathological lying [Bloom, 2013]. Moreover, Baron-Cohen [2011: 8] explains in *The Science of Evil: On Empathy and the Origins of Cruelty* “how people can be cruel to each other not out of evil but because of empathy erosion.” What is more, according to Bazelon [2013a], one main trait of bullies is the utter lack of empathy, warning that they can become full-blown psychopaths. But in a published conversation with her editor [Bazelon, 2013b: online] she also acknowledges the fact that “goodness, empathy and character building can be taught” because “true inability to feel empathy, luckily, is exceedingly rare” and “[m]ost kids do feel and can learn to feel empathy and remorse.”

Therefore, as this dissertation argues, it is necessary to practice empathy, to train the ability to empathise with others and be aware of the need for goodness as a safe path to the sustainability of our human coexistence. Paul Bloom [2013: online], in his article published in *The New Yorker*, quotes the words of U.S. President Barack Obama from a commencement speech given at Xavier University: “When you think like this –when you choose to broaden your ambit of concern and empathise with the plight of others, whether they are close friends or distant strangers– it becomes harder not to act, harder not to help.” And this must also be the thinking pursued in architectural training: to empathise with others, even with distant strangers, in order to create better designs, to help them, to enable them by design.

It is about designing under a user-centred approach “founded on a desire to not only improve products and services by listening to the Other (sympathy) but by engaging directly in the Other’s ‘life-world’ (empathy)” [Holt, 2011: 155]. Hence, it is about an empathic design which, as observed by Strickfaden and Devlieger [2011: 215-216], “involves more than just talk. (...) Simply observing others is not enough. Interacting and relating with others, particularly those who are significantly different, is essential.” Thomas [2007: 5] declares that the importance in the act of empathising is “that the person extending empathy to another has useful comparisons to enable it to be close and relevant.” That is why role-playing exercises are highly effective, such as the disability simulations encouraged by the present study in the following sections, where the designer tries to become the user. In fact, this methodology is not only being explored in design areas, but it has also obtained notable results in the medical sciences. The evidence for this is provided by Varkey *et al.* [2006] in a study where medical students took part in ‘the aging game’, a simulation exercise to experience the problems of the elderly. They recreated the loss of fine motor coordination, having cataracts, or living in a long-term care facility. It was found to be an effective method for increasing empathy and improving attitudes toward caring for the elderly.

Nonetheless, it is important to stress the fact that a mere role-playing experience is not enough to let empathy flourish; for genuine, comprehensive empathy, it is also necessary to empower interactions between researchers and research subjects; it is about spending time together. For example, Strickfaden and Devlieger [2011], in their article *Empathy through Accumulating Techné: Designing an Accessible Metro*, address the case study of the redesign of Brussels’ metro as a co-creation process between people with and without disabilities over a two-decade period. They explain how, thanks to the redesign that occurred over an extended period of time, the working group was able to get to know each other, which resulted in deeper empathy for one another and mutual trust and respect. This case study, which has been underway with meetings over a number of years, can be compared to the intensive character of the case study *LOCUS IP*, which will be explored next, where the cohabiting time is reduced to two weeks 24/7. In short, what is needed for a successful empathic connection, whether it entails occasional meetings or continuous cohabitation, is to have time enough to interact, share and develop relationships, which does not happen in a single day.

What is more, the authors of the article also describe how this mutual respect developed among the disabled users, the working group of transport companies and service developers. As a result, they came to feel that it was necessary to break generalised assumptions and to not accept dependency and secondary solutions as feasible options. For instance, firstly “[i]t was assumed that people who are blind and visually impaired neither need nor have independence, and further that they would be satisfied with (and need) help to negotiate their travel through gaining assistance from the general public or by making a phone call.” Hence, typical assumptions about disabled people were conditioning the design solutions, even to the point that in one of the first designs the information panels included “a visual message, aimed at people with sight, which indicated ‘help them’ with the symbol of a blind person with a cane.” This assumption entailed charity and compassion –which is far from being empathic– from people without disabilities, which is a detriment to blind people’s autonomy. Later on, the authors explain how this solution, aside from disabling even more people with visual impairments, turned out to be completely futile: “Subsequently, this initial design solution was not particularly useful to users; ultimately people with visual impairments and blindness did not use the information panels.” [Strickfaden and Devlieger, 2011: 218]

To sum up, empathic design processes require, to some extent, the direct participation of the research subjects –in the present discussion, the involvement of PwD– even if they are not designers themselves, in order to consider people’s direct experiences rather than basing design on “de-personalized descriptions”, to an expression of Fulton Suri [2000]. Furthermore, it requires collaboration for a sufficient amount of time, so that a genuine awareness of the other is reached, and more importantly, at an affective, emotional level. Thus, it becomes harder not to act, and the desire to do something good springs forth. Therefore, a change of values towards goodness, the drive to improve and perfect the conditions of life through design, is the result of an empathy-based design. What is more, “the user is no longer considered the end of the design but the starting point” [Holt, 2011: 153], which is essential for overcoming the failure of accessible designs, which was addressed in previous sections of this dissertation.

One might ask if there are limits to empathy and what is their scope. Is it possible to empathise with everybody? Is it possible to empathise with thousands of distant strangers? Several researchers [Jenni and Loewenstein, 1997; Nisbett and Ross, 1980; Redelmeier and Tversky, 1990] point out “the identifiable victim effect” hypothesis, which is sharply illustrated by Schelling [1984: 115]:

“Let a six-year-old girl with brown hair need thousands of dollars for an operation that will prolong her life until Christmas, and the post office will be swamped with nickels and dimes to save her. But let it be reported that without a sales tax the hospital facilities of Massachusetts will deteriorate and cause a barely perceptible increase in preventable deaths –not many will drop a tear or reach for their checkbooks.”

Likewise, at the time of this writing, Mateo is a Spanish two-month-old baby boy affected by leukaemia and who has shaken up the social networks in the search for a bone marrow donor. His webpage (<http://medulaparamateo.com/>) has reached over 55,000 visits in less than 24 hours, according to the media, and several elite Spanish athletes and other celebrities have joined the cause. The impact on the net has been so multitudinous that English (<http://marrowformathew.com/>) and Portuguese (<http://medulaparamateus.com/>) versions of the website have been created to reach the entire American continent in a vehement search for bone marrow. Meanwhile, the Spanish government has announced further cuts to the dependency law (*Ley de Dependencia*), with estimated savings of over 1.5 million Euros, which harms nobody other than the most vulnerable: those with less income to afford indispensable orthopaedic aids, medical attention, or assistant staff. As a result, some families live in an untenable situation, with few other options aside from resorting to public elderly care centres (supposing that they can assume the

cost), which already have a waiting list of 17,000 people, as published on 2013 August 1st in the online Cataluña Edition of the national newspaper *El País* [Mouzo, 2013: online]. These cuts are a result of setting limits on budget deficits and debt issuance, reasoned necessary by the Spanish government, in a drive to meet budget goals agreed with the EU. Thousands of families are left in a helpless situation, but in contrast with the Mateo issue, almost nobody is talking about these families because they are reduced to pale statistical abstractions.

Something similar happens if we consider global warming, for instance. In *The Empathic Civilization*, Jeremy Rifkin [2009] claims that a global empathic consciousness is urgent if we want to avoid planetary collapse. According to the author, catastrophic climate change is threatening our very existence, but it seems that there is no human reaction. The American politician Al Gore [1992] already denounced this fact in his book *Earth in the Balance* over twenty years ago, which was followed by the film *An Inconvenient Truth* in 2006, which attempted to reach the broader public. Nowadays, the reality is that we are still aware that our excessive CO₂ emissions and exorbitant consumerism are far too much for the sustainability of the Earth, but we are not truly doing anything about it. The reason is close to that of why we reject accessibility and disability: because it is too far away, too abstract, too unlikely; we do not want to think about it, and maybe it won't even happen.

Likewise, within the field of business, we can also point to a general lack of empathy towards people as a result of excessive greed for making profits. Patnaik [n.d: online] criticises:

“Modern capitalism has systematically sought to suppress our need to connect with other people. Managers and economists alike encourage businesspeople to look at the data, not the people. (...) This terrible trend can be summed up in the familiar phrase: ‘It’s not personal, it’s business’.”

Instead, Patnaik stands for widespread empathy, which is understood as a global empathic attitude towards others. There are already encouraging examples showing how this change towards widespread empathy is possible. What is more, this has led to outstanding results. For instance, Patnaik [2009] explains in *Wired to Care* how companies such as Nike or IBM have prospered thanks to building a culture of widespread empathy for the people they serve. Furthermore, he advises companies to stop seeing themselves and their customers as different entities, but recognising that all belong to “the same tribe”. Once more, this understanding is very close to the one defended in this dissertation: architects/designers must stop seeing themselves and disabled users as ‘us’ and ‘them’, but instead must imagine that they are the same person. The outcomes can be immense.

In contrast, some detractors defend that this widespread empathy is possible only if we all have a pure altruistic attitude towards others, which is quite unlikely to happen. Daniel Batson [1991, 2011], an American social psychologist, has developed the ‘empathy-altruism hypothesis’, asserting that if you feel empathy towards another person, a motivation to help is immediately evoked, regardless of what you can gain from it. In any case, the possible benefits are unintended consequences. Frans de Waal [2008: 281], in his article *Putting the Altruism Back into Altruism: The Evolution of Empathy*, states that “altruism carries an initial cost, and positive consequences occur only after a significant time interval (e.g., the recipient reciprocates) or not at all (e.g., care for dependent kin)”. De Waal is talking about primates, yet it is often assumed that animals act according to return-benefits expectations. He adds that “[t]he common claim is that humans are the only truly altruistic species”, and animals somehow expect others to return the favour. However, whether humans are the only ones capable of acting for altruistic reasons or not, or whether ‘true’ empathy really exists or it merely derives from a gain-in-return expectation [Cialdini *et al.*, 1997], it is essential to concentrate on the ‘positive consequences’ of an empathic attitude:

O’Malley [1999: 23] describes how “offering your empathy for another’s suffering; it enriches

not only the receiver but the giver”; how the most frequent observation of a volunteer is that he/she went to give something to people in need, but it turned out that he/she was receiving something important in return. Hence, there is some positive consequence after all: the reward of feeling useful. All of us want to believe our lives are useful in some way, to feel that our actions are meaningful to somebody, to have an ultimate purpose in life; “[a] sense that you are not negligible, that you can in fact make a difference, a small difference maybe, but a meaningful one.” [O’Malley, 1999: 25]. Therefore, the empathic concern asked here for others –i.e., an empathic design of the built environment that includes all– does not entail a selfless, purely altruistic action, but quite the contrary: it must be understood as a win-win situation, since we all will benefit, sooner or later, from accessible environments. “Humans have so little control over empathic activation that they regularly shield themselves from it, e.g., by covering their eyes when in a movie something gruesome is about to happen” [de Waal, 2008: 291]. Many people have the same reaction when thinking about themselves getting older and losing their abilities, but it is a fact that we must accept in a natural manner and act accordingly.

To conclude: Why empathy in design? Because it leads to healing environments, because the result is without exception a win-win situation. Developing an empathic awareness towards design is of great importance because it allows us to “capture something which concerns most people even if it is on a subconscious level” [Cold, 2001: 20]. Pallasmaa [2001: 216] compares the task of the architect with the therapist:

“[W]hereas the therapist deals with a person’s external condition and tries to make his experiences and interpretations of his own life condition more favourable, the architect, working in the same dimension, endeavours to make the spatial-material experiential horizon of life more positive.”

We should be aware at all times that “[i]t is perhaps when our lives are at their most problematic that we are likely to be most receptive to beautiful things” [de Botton, 2006: 150], and this is why it is so important to rethink and redesign certain elements and spaces, because it is necessary to encourage people by making these elements appealing and beautiful instead. An empathic design is a tool in the architect’s hand for defeating the negative connotations of ageing, of becoming dependent and vulnerable; architects must empathise with the feeling of powerlessness if they want to create welcoming, pleasant, long term, sustainable environments.

A great example of empathic design is Alvar Aalto’s Paimio Sanatorium (early 1930s): “Whilst designing the sanatorium, Aalto fell ill and had to spend some time in a hospital where he could examine the surroundings from a patient’s point of view”, thus he became a user and not only an external designer of the facility. He really empathised with being a patient, how it feels to be laying down in bed for hours and staring at the ceiling endlessly; so he designed the patient’s room accordingly. He experienced how it feels to be in a vulnerable situation and what feelings can be aroused due to the built environment; as a result, he searched for the most comfortable and reassuring design through soft lights, warm colours and even noiseless washbasins. “On the basis of his hospital experience, Aalto concluded that the subject of the design should always be ‘man at his weakest’.” [Pallasmaa, 2001: 217]

4

Case study:
LOCUS IP

LOCUS IP is the case study that will be analysed next to validate the assumption of the necessary empathic approach towards design in order to achieve genuine inclusive architecture; that is, built environments that are flexible, usable, beautiful and sustainable, so that everybody is keen to inhabit them.

Developing an understanding of an emphatic architecture is essential for defeating the ‘design for the disabled’ denounced in the previous pages. The aim is to bridge the gap from the accessibility codes, which often are too rigidly and limitedly approached, to architectural practice. A fundamental way to change this current paradigm is through educational programmes, and that is the reason of interest of the next case study, LOCUS IP. Regulations are basically barrier-free codes, mainly redacted to ensure the removal of architectural barriers, but they do not approach the subject in a more holistic way. As Steinfeld and Maisel [2012: loc.802] claim, creative thinking and a change in perspective is necessary: “It is not sufficient merely to apply design criteria in accessibility regulations in a mechanistic way. Often a change in perspective is needed.”

Accessibility must be understood as an indispensable requirement for everybody, and not just for PRM. It must go beyond the barrier-free approach to include further concepts of equality, usability, aesthetics, affordability, etc. However, nowadays, accessibility codes do not define these latter concepts in their redaction; thus it is understandable that those public spaces requested to be accessible by law, often end up being just barrier-free. It is fair to explore the debate on whether accessibility standards should be reviewed and redacted in a more inclusive, broader understanding or, on the contrary, if doing that would increase even more the rigidity of accessible solutions. Nevertheless, this thesis supports the idea of an *empathy-based design* for achieving high quality accessible environments for everybody, and this understanding must be trained at Architecture Schools. That is, architects need basic education on diversity, equality and social justice, as well as humane performance, aesthetics and sustainability. In this way, endless ramps or climbing stair platforms, for instance, are not installed as secondary accessible itineraries, although legal according to regulations. In other words, architects should learn about designing based on benefits for all, rather than requirements for a minority, and this is what LOCUS IP will explore next.

In LOCUS IP the study consists of evaluating the effects on architectural students from intensive teaching that entails complete immersion into the topic of accessible design. In addition, the direct participation of PwD, the immediate beneficiaries of the study target, is promoted in order to develop a major empathic connection with the topic. This methodology is considered innovative because “[w]hile traditional scientific research calls for objectivity and distance between research participants and researchers, *empathic* strategies rely upon more *collaborative* and *interpretative* approaches.”

[McDonagh and Thomas, 2011: 147] The aim is to shift to a human-centred approach, and this is important because designers, as architects, are primarily concerned with “proposing realizable artefacts for others” [Krippendorff, 2006: 20]. Thus, there is an unquestionable social component of architecture, which implies more existential factors, such as emotions and feelings, rather than merely technical knowledge, such as constructive details and structural calculations.

The objective is to evaluate the designs originated under a learning environment where the students can gain insights into the topic of accessibility in a natural and autonomous way: by means of sharing activities and spending time together with differently abled professors and schoolmates, as well as experiencing disability simulations. This is relevant because, as Ostroff [2003b] explains, the experiences of the designer usually differ from those that they design for, thus gaining insights into the experiences of a study target group can be invaluable in understanding them and proposing better designs. According to one of the Design Council’s [2010: online] publications: in the UK a typical designer is aged thirty-something, Caucasian and often male; hence, at times, the result ends up in a limited understanding of more diverse user groups and their needs and habits. This can be easily transferred into the architecture field, where architects are not so familiar with those who are different from them, the standardised population. Thus, the ones that are not alike often end up out of the design.

To sum up, the aim of the following case study is to undertake research on the topic of *accessibility*, with the specific problem or area of interest described as the *failure of accessible designs*, under the paradigm of the *design for the disabled*, in order to arrive at conclusions for an *inclusive design of the built environment*. The research also explores how an empathic approach towards the topic can help to understand the disabled user’s deeper values and needs, and this is fundamental for reaching sustainable designs and providing inclusive environments.

4.1 Introduction

As explained in the introductory chapter of this dissertation:

Let’s Open Cities for Us Intensive Programme (**LOCUS IP**) is an academic activity within the Erasmus framework that I have coordinated for three years (2008-2010), counting on the partnerships of 9 European Schools of Architecture. Generally, four to six students –mainly from the 3rd, 4th and 5th years of studies– and one to two professors from each partner university have participated in each workshop. The study has been carried out in the particular conflictive territory of accessibility in heritage-protected environments and the project’s aim was to explore the significant value of and need for teaching and researching accessible design. Each study took place in a two-week workshop format and in the following Iberian and Balearic cities: Tarragona (Spain -2008), Girona (Spain -2008), Évora (Portugal -2009) and Ibiza (Spain -2010).

In addition, ***Let’s Open Tourism for Us*** Intensive Programme (**LOTUS IP**), which was coordinated by the school of architecture in Montpellier ENSAM (France) in 2011-2013, is the academic successor and natural continuation of the previous LOCUS (2008-2010), after reaching the maximum duration of a standardly established IP in three years. Although not being the direct coordinator of LOTUS IP, I have supported it and participated on the teaching staff in all 3 workshops held in French territories; specifically in: Sète (2011), Bonifacio (Corsica - 2012) and Saint-Denis (La Réunion - 2013).

Having cleared this point up, the analysis of the present case study will be carried out by considering the following. On the one hand, the design proposals of LOCUS students will be

meticulously examined and compared in detail (but not LOTUS students' proposals). On the other hand, the questionnaires answered by LOCUS and also LOTUS students (hereafter LOC/TUS students) will be evaluated in order to enrich the results analysis with more comparative data.

Following, a more detailed explanation about LOCUS IP is provided: LOCUS IP's main interest consisted of exercising the objective of giving equal access regardless of people's different abilities, without considering those with disabilities as 'special cases' and limiting them to restricted spaces, alternative itineraries to reach their destinations, etc. At the same time, it maintains the stability of the city's heritage. The task was to conceive the city as universally usable as possible, to achieve inclusive urbanism. That is, the target aimed at researching and practicing fully inclusive architecture: an intelligent architecture that can equally address all our present demands, regardless of people's different capacities, and without renouncing the beauty and harmony we perceive in our inheritance.

In order to gain more input and different views on the topic of inclusive design, efforts were made to maximise the variety of participating countries; all of them represent various European regions with distinct approaches to accessibility and disability issues (in alphabetical order): Finland, France, Germany, Italy, Poland, Portugal, Romania, Spain and Sweden. A group of about 30-35 students participated in each workshop, which were split into mixed-ability and multicultural teams of 3-5 students to foster group discussion and cooperative learning. (For further info about LOCUS IP [Bordas Eddy, 2013], refer to its publication enclosed with this dissertation).

The methodology has consisted of recreating similar case studies on medium-sized cities with comparable topography and development growth, i.e., analogous mobility problems between the old centre located atop a hill and the new city below. It confronted a highly complex situation: accessibility must be guaranteed for all, regardless of their different abilities, but at the same time the heritage of the city must be respected; that is, solving a problem in a scenario where any proposal faces the most controversial opinions. The analysis and comparison of the results over the three consecutive years of duration, with its slightly different changes in teaching content and exercise proposal, allows a definition of conclusions.

What is more, the LOCUS IP working system consisted of proposing the exercise to be solved as an architectural competition. This particular approach had two direct notable effects worth mentioning. On the one hand, inviting experts and local authorities to take part in the jury and to award the three winning projects boosted perception of the activity as more utilitarian and realistic. This, of course, enhanced the participants' enthusiasm and motivation. On the other hand, the fact that the students' proposals end up displayed as a competition, guarantees them practicing their layout presentation skills, since the project panels must be comprehensible without somebody explaining them orally.

The expected results are to identify the outcomes of teaching under 'empathy-based design' principles, and how this educational approach substantially changes the students' final designs. Students are encouraged to explore human diversity by means of disability simulations, to embody and conceive multisensory architecture by paying attention to other often lately forgotten aspects in design such as sound, temperature, texture or colour (which may be basic for people with special needs, but also useful and pleasant for the rest of the people). Because the form and spaces generated directly affect all our senses, all human senses must be taken into account in every design process, not only seeing, but also touching, hearing and smelling. It is about engaging the students –the future architects– to the point that it is understood that it is not about 'architecture for the disabled' but architecture for all; thus, inclusive architecture.

Therefore, the aim of the survey is to evaluate the 'empathy-based design' approach encouraged

by this kind of activity, and to explore how it might lead to a change of understanding the role of the architect and the built environment, towards more social and sustainable criteria. Thus, the results of the survey will be analysed to evaluate the learning atmosphere and outcomes obtained in this kind of workshop. As often happens with qualitative research using a survey methodology, the more relevant information was the feedback obtained from the open-ended questions. Thus, many of the comments received by the LOC/TUS participants will be enclosed throughout the discussion. As English was not their native language, there were many errors in their responses. For the purposes of comprehension, their responses have been corrected. (For a detailed description of the questionnaire and general statistics, please refer to the corresponding section, *Annex C. LOC/TUS Surveys*, attached at the end of this document.)

A total of 75 questionnaires have been analysed, approximately 60% females and 40% males. Most of the students were in their twenties and mainly in their 3rd, 4th and 5th years of studies. It is worth noting that all the questionnaires were launched during the academic year 2012-13 and unfortunately not all participants were reached (only a little more than one third of the participants replied the survey), since the contact data for many of them was their student email account, which on some occasions was no longer operative due to them having already finished their studies. Following is a summary chart (Tab.1) of survey respondents, indicating countries of origin and year of participation in the programme:

Table 1: Participants vs. Respondents in LOCUS and LOTUS workshops

| SURVEY RESPONDENTS | | | | |
|--|----------------------------|-------------------------|-----------------------|----------------------|
| Home University (ordered alphabetically) | N° of participants / Event | | N° of participants | N° of respondents |
| ENSAM (La Réunion, France) | 2 | LOTUS - Bonifacio 2012 | 8 | 5 |
| | 6 | LOTUS - La Réunion 2013 | | |
| ENSAM (Montpellier, France) | 6 | LOCUS - Girona 2008 | 29 | 11 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| | 6 | LOTUS - Bonifacio 2012 | | |
| | 5 | LOTUS - La Réunion 2013 | | |
| ETSAV (Sant Cugat del Vallès, Spain) | 5 | LOCUS - Tarragona 2008 | 31 | 18 |
| | 6 | LOCUS - Girona 2008 | | |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| | 4 | LOTUS - Bonifacio 2012 | | |
| | 4 | LOTUS - La Réunion 2013 | | |
| FAUTL (Lisbon, Portugal) | 5 | LOCUS - Tarragona 2008 | 17 | 5 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Bonifacio 2012 | | |
| JADE-HS (Oldenburg, Germany) | 6 | LOCUS - Girona 2008 | 26 | 5 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| | 4 | LOTUS - Bonifacio 2012 | | |
| | 4 | LOTUS - La Réunion 2013 | | |

| SURVEY RESPONDENTS | | | | |
|---|----------------------------|-------------------------|--------------------|-------------------|
| Home University (ordered alphabetically) | N° of participants / Event | | N° of participants | N° of respondents |
| LTH (Lund, Sweden) | 5 | LOCUS - Tarragona 2008 | 19 | 2 |
| | 4 | LOCUS - Évora 2009 | | |
| | 2 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Bonifácio 2012 | | |
| | 4 | LOTUS - La Réunion 2013 | | |
| PK (Cracow, Poland) | 6 | LOCUS - Girona 2008 | 18 | 7 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| TUT (Tampere, Finland) | 4 | LOCUS - Évora 2009 | 16 | 7 |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Bonifácio 2012 | | |
| | 4 | LOTUS - La Réunion 2013 | | |
| UAUIM (Bucharest, Romania) | 5 | LOCUS - Tarragona 2008 | 21 | 4 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| | 4 | LOTUS - Bonifácio 2012 | | |
| UNIRC (Reggio Calabria, Italy) | 6 | LOCUS - Girona 2008 | 26 | 11 |
| | 4 | LOCUS - Évora 2009 | | |
| | 4 | LOCUS - Ibiza 2010 | | |
| | 4 | LOTUS - Sète 2011 | | |
| | 4 | LOTUS - Bonifácio 2012 | | |
| | 4 | LOTUS - La Réunion 2013 | | |
| URV (Reus, Spain) | 2 | LOCUS - Tarragona 2008 | 2 | - |
| TOTAL | | | 213 | 75 |

Source: Own elaboration based on LOC/TUS surveys

This being said, the most relevant design strategies to solve the lack of accessibility in historic urban centres will be categorised and described next, in section 4.2. *Design solutions analysis*, together with some examples of the LOCUS students' proposals to illustrate each of them. While further considerations and reflections, which arise from the analysis, will be presented in the following section 4.3 *Theoretical discussion*, as well as the most relevant conclusions of the survey.

4.2 Design solutions analysis

"[T]he root of the true practice of education (...) must start from the particular fact, concrete and definite for individual apprehension, and must gradually evolve towards the general idea." [Whitehead, 1967: 64]

The expected learning from LOCUS IP departs from the particular fact of accessible design for the disabled to arrive at the broader and all-embracing idea of inclusive architecture and urbanism. That

is, students firstly concentrate on learning about the mobility problems that PwD must face when wandering around a historic urban space, and they learn this in order to finally design proposals that are equally beneficial and enjoyed by all the inhabitants. To validate the accomplishment of this goal, let us examine the main strategies designed by the students to solve the problems of good connections between the old city centre (which is located atop the hill and surrounded by Medieval Walls) and the new city growth below, as well as the inner mobility within the historic city centre.

In general terms, the proposals made by the students can be classified in four main categories: *4.2.1 City sewing*; *4.2.2 New entrance*; *4.2.3 Innovative transport systems*; and *4.2.4 Multisensory design*. On the one hand, the first two categories *4.2.1 City sewing* and *4.2.2 New entrance*, concern the design of mechanical vertical connections, whether they be lifts, funiculars or mechanical ramps integrated in the architectural historic surroundings. On the other hand, *4.2.3 Innovative transport systems* and *4.2.4 Multisensory design* illustrate designs of other groups of students who preferred to concentrate on improving the inner circulation within the city centre rather than daring to introduce greater architectural interventions in the patrimonial built environment. This was accomplished by designing innovative transport systems or by introducing soft elements to improve navigation and the experience of the architectural surroundings.

Let us proceed with the analysis of each of them.

4.2.1 City sewing

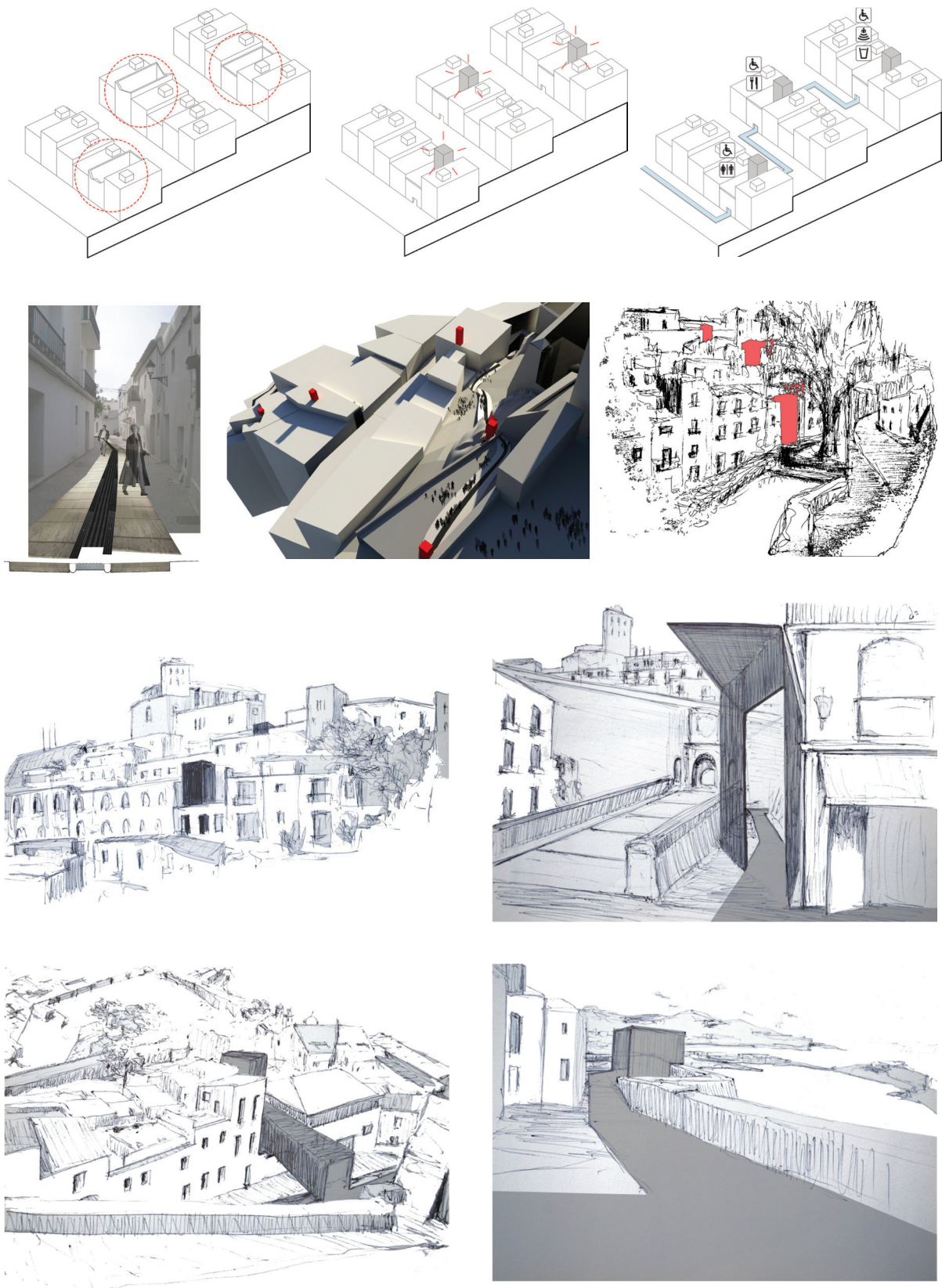
The ‘city sewing’ concept consists of locating those particular points –empty plots or existing buildings– that are considered strategically situated, since they connect two or more streets at different levels.

In such spaces it is highly convenient to install a lift for public use. Thus, a difference in level of about 5 to 20m, depending on the circumstances, will be easily compensated and without major problems. In terms of mobility, these kinds of interventions sew the city up, because they repair interruptions along the pedestrian paths, and this in turn revitalises the commercial activity and facilitates greater consolidation of the area. Quoting the words of the Brazilian architect and urban planner, Jaime Lerner [2011: online], installing a lift at a strategic point is tantamount to ‘urban acupuncture’ because “it revitalizes a ‘sick’ or ‘worn out’ area and its surroundings through a simple touch at a key point. Just as in the medical approach, this intervention will trigger positive chain-reactions, helping to cure and enhance the whole system.”

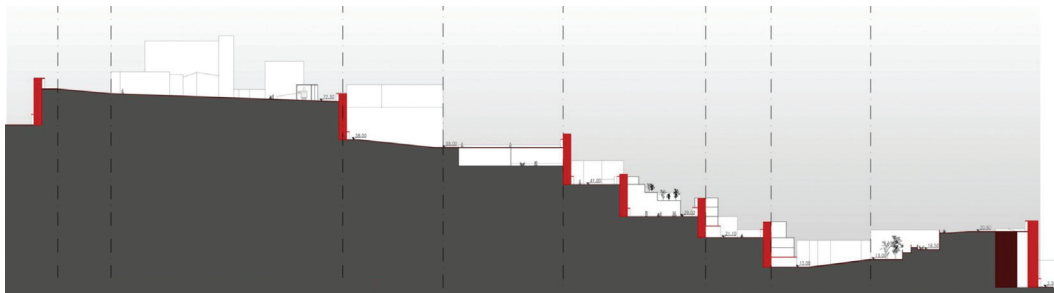
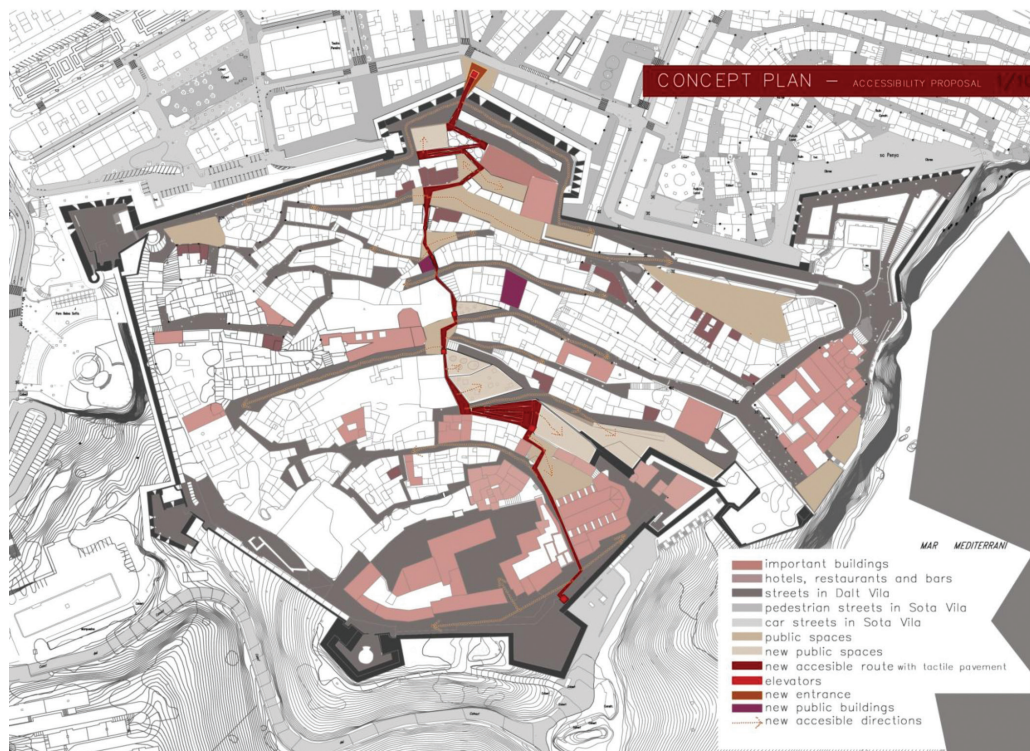
In relation to this ‘city sewing’ concept, a brief comment should be made about the winning projects from the internal competition held at the LOCUS workshop in Ibiza, proposals that greatly developed this approach: Ibiza is similar to the other cities studied by LOCUS in that it has its historic centre located atop a hill, surrounded by defensive walls, which makes mobility notably difficult because of the steep sloping streets and the arduous connections between the old and new parts of the city. It is worth mentioning that the Ibiza historic centre is mainly uninhabited, most likely because of the difficulty in accessing the upper area. Hence many buildings are unoccupied. The first and second prizewinning projects (see Fig.10a and Fig. 10b, respectively) proposed a similar strategy of installing a system of interconnected lifts integrated into the existing unoccupied buildings. The first-prize project developed a brilliant dialogue with the built environment that it inherited: accessibility is introduced subtly, resembling the existing structures so that the facades are conserved while the lifts rise inside,

like the ancient towers did. The aim here was to allow the new ‘accessibility layer’ to appear as a sign of modernity while ensuring conditions of mobility and orientation within the city.

Figure 10a: *City sewing*; strategic installation of lifts for accessible paths.



Source: Ibiza G3 - 1st prize

Figure 10b: *City sewing*; strategic installation of lifts for accessible paths.

Source: Ibiza G8 - 2nd prize

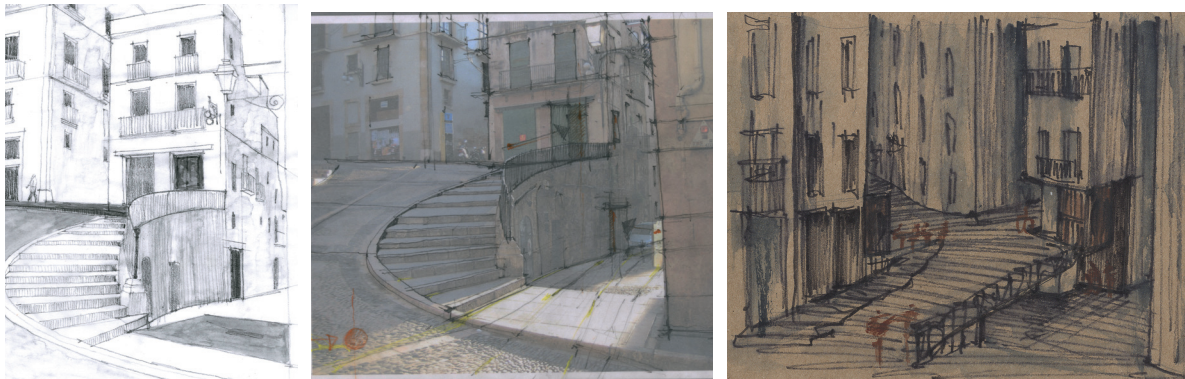
As a matter of fact, many different working groups, when studying a particular city, concurred on the location where a lift or another system of mechanical transportation was needed to ‘sew up’ the urban environment. This coincidence pointed out, unequivocally, the need for such an intervention. For instance, taking a closer look at the Tarragona case study: first of all, it was one of the most important cities of the Roman Empire and the city’s historical centre was built on the three great terraces of that period: the Roman Circus, the Provincial Forum and the Temple Complex [Macias, 2007]. Even today, the structure of these terraces can be clearly seen in Tarragona. Each of them is generally flat, though obvious difficulties still exist in moving from one to the other. Each terrace is several meters higher than the other, respectively, and connected by extremely steep streets or steps. Therefore, it is not difficult to move around because it is flat; the main problem is moving between them.

In such a clearly structured urban environment, it is not surprising that almost all LOCUS-Tarragona workgroups detected the same ‘dark point’ to solve, which is located between the levels of the ancient Roman Circus and Provincial Forum, on the street named *Baixada de la Misericòrdia* (it is worth noting its English meaning: The Descent of Mercy!). This street’s slope is above 20%; the road is paved with pebble stones while the sidewalks have stairs on both sides. Analysis of the site confirmed the impossibility of adjusting it to the maximum allowable slope permitted by regulations. Thus the most repeated solution was to install a lift, taking advantage of the structure of an existing building strategically located on *Baixada de la Misericòrdia*. Hence, this case study definitively highlights the dark point where a mechanical vertical connection is needed, as the reader might see if comparing the different students’ proposals in Fig.11.

Figure 11: *Location of ‘dark points’*: Several coinciding LOCUS-Tarragona proposals for installing a lift in Baixada de la Misericòrdia St



Source: Tarragona G3



Source: (from left to right) Tarragona G6, G2, and G5

It is worth mentioning that afterwards some of the students even decided to work in detail on these identified ‘dark points’ as their Master’s Thesis Project. For instance, two LOCUS-Tarragona

students from UPC, Carlos Vidal and Laura Padrós, decided separately to work more in depth on the *Baixada de la Misericòrdia* ‘dark point’ for their Master’s Thesis Project. On the one hand, Vidal approached the project from a more urban planning perspective, developing a detailed project consisting of repaving the entire main axis of circulation to provide a barrier-free surface, smoothing slopes when necessary, and installing a lift in the mentioned existing building strategically located on *Baixada de la Misericòrdia*. The project (see Fig.12a) consists of removing the existing floors and then building a new one at the same level as the upper street, which will be connected by the lift to the new entrance at the lower street. The facades are integrally preserved, except for the upper floor, which is replaced by an attic window, providing additional illumination. This becomes recognisable from the outside as an ‘accessible path’.

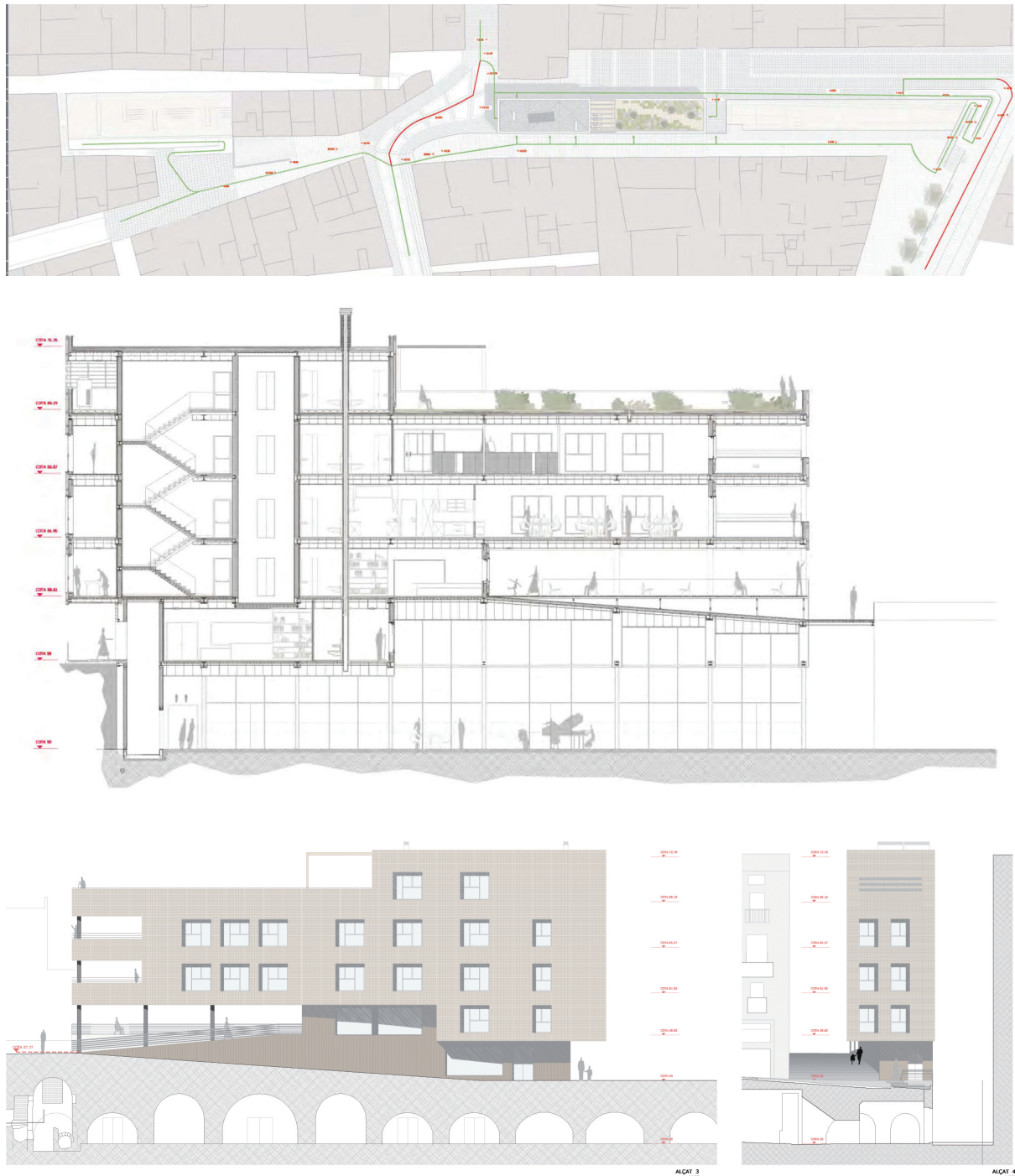
On the other hand, Padrós (see next Fig.12b) opted for demolishing the derelict buildings of the site, in order to construct a new building able to meet the demands of the neighbourhood while also taking the opportunity to install a public lift, which is hidden inside the building but open to external users. After analysing in detail the area’s uses, needs, existing facilities and inhabitants, it was finally decided that the new building should be a care centre for the elderly. Concerning urban connections, the proposed intervention offers a double solution, thanks to the sufficient length of the building site: at one end, a public lift is provided to quickly overcome the current barrier that represents Baixada de la Misericòrdia St. in the exact same position as Vidal’s proposal, while at the other end a public park is created with soft ramps for greater ease of access.

Figure 12a: Example of Master’s Thesis Projects that solve the ‘dark point’ located on Baixada de la Misericòrdia St.



Source: *Study for the accessibility of the pedestrian route from Plaça de la Font to the Cathedral in Tarragona*; by Carlos Vidal (EPSEB-UPC, 2008)

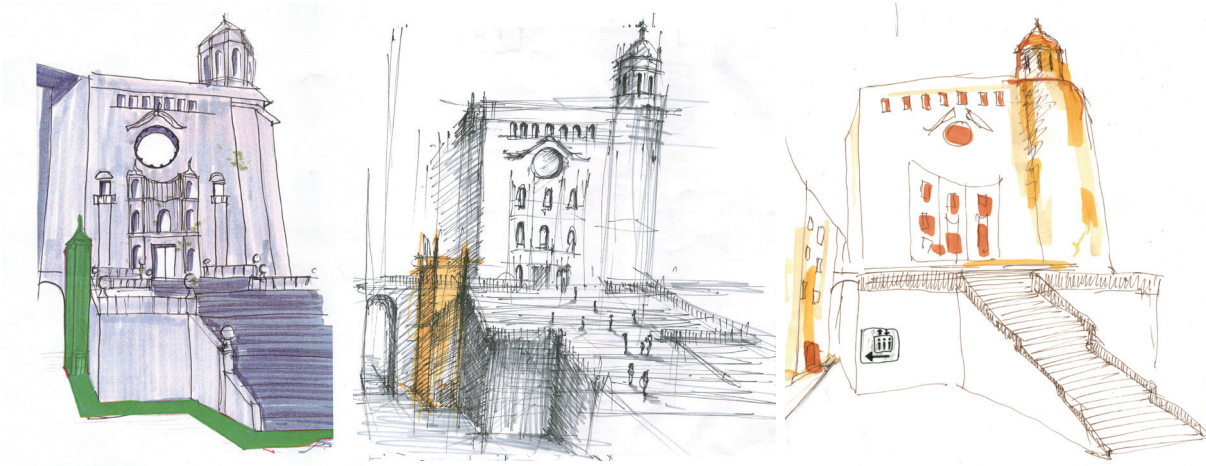
Figure 12b: Example of Master's Thesis Projects that solve the 'dark point' located on Baixada de la Misericòrdia St.



Source: *Public facility in Tarragona's old quarter*; by Laura Padrós (ETSAV-UPC, 2010)

However, the reality is that most cities are not as topographically terraced as Tarragona. In the case study of Girona, for instance, the city is extremely topographically complex: there are numerous steep streets, some of them converted into sets of steps, which makes mobility highly complicated for visitors and inhabitants. Looking closely at the slope-map, it is possible to locate several red areas, but not one clear 'dark point', as in the case of *Baixada de la Misericòrdia* in Tarragona. Nevertheless, many LOCUS-Girona working groups also coincided on one location where a 'mechanical vertical connection' is needed. The most repeated proposal was to install a lift next to the steps leading to the Cathedral, as shown in Fig.13:

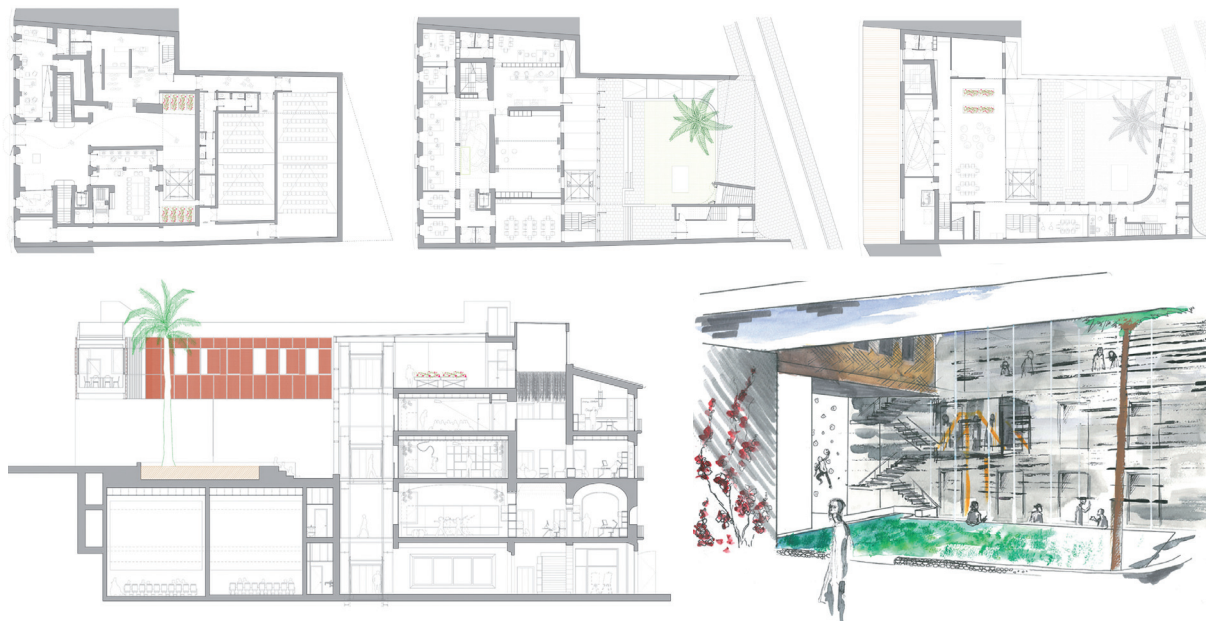
Figure 13: *Location of 'dark points'*: Several coinciding LOCUS-Girona proposals suggesting a similar location to install a lift for easy access to the Cathedral.



Source: (from left to right) Girona G4, G3, and G2.

To provide more examples of 'city sewing', where selecting the right 'acupoint' can improve urban mobility by reusing an existing building or by occupying an empty spot, it is worth briefly introducing Carles Tuca's Master's Thesis Project (see next Fig.14). He is a UPC student who also participated in LOCUS-Girona, and Tuca focused on an eighteenth-century mansion enclosed between two streets with a 10m difference in height. His proposal was to restore the mansion and open it to the general public as a civic centre, a cultural and social facility that becomes a powerful node of leisure and entertainment. The aim of the project is to extend the public circulation by taking advantage of the built space to install mechanical systems of vertical connections. In this way, a continuous, fluid and accessible urban path is achieved by mechanically connecting two streets which are at different levels separated by approximately ten meters. A new green square is constructed at the higher level street to create the new entrance to the building. The facades are rebuilt to accommodate the new use of the building, while the original structural distribution is maintained to reflect the mansion's original character.

Figure 14: Example of Master's Thesis Project reusing a building as an 'urban acupuncture' point, to improve mobility and create a new centrality in the city.



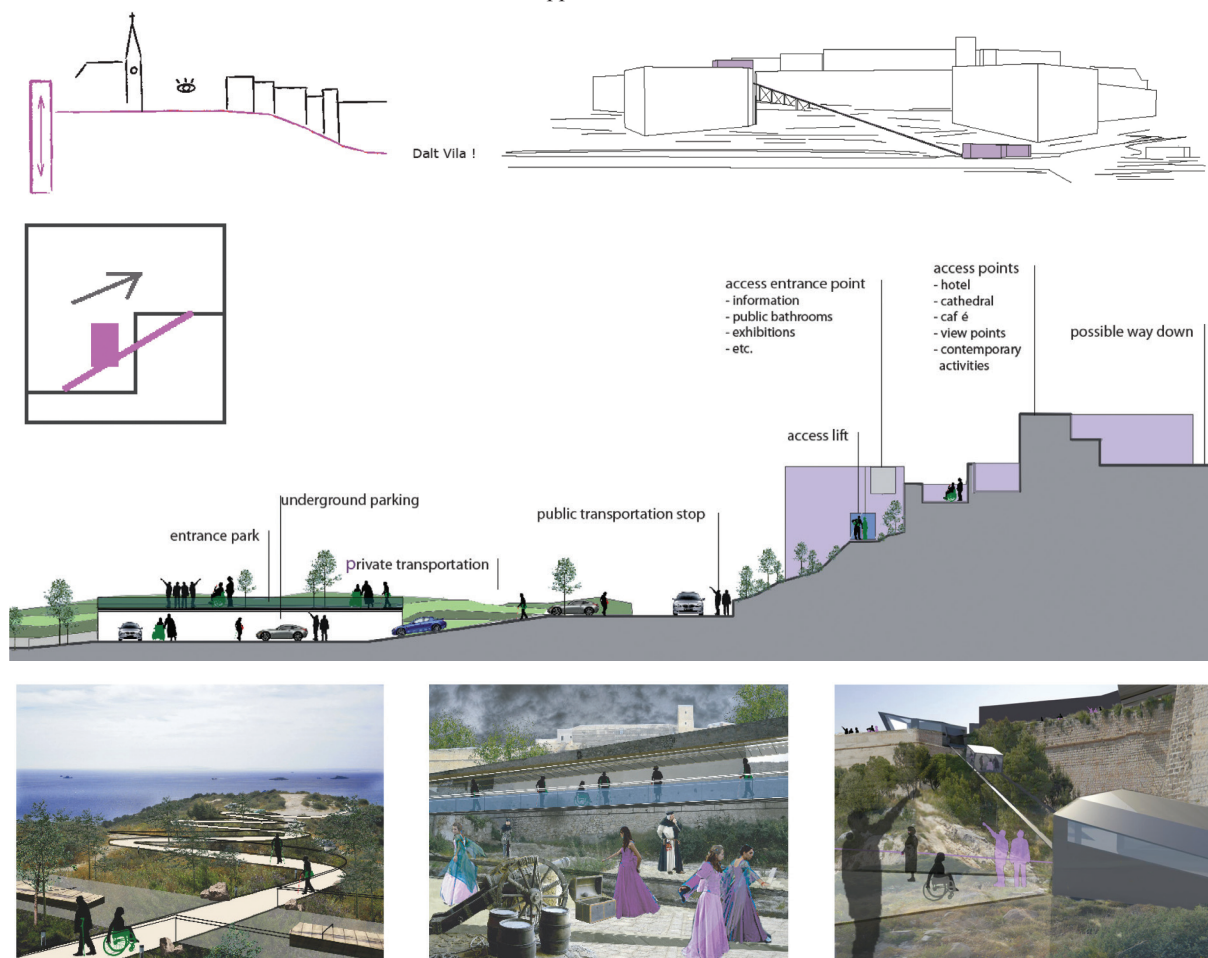
Source: *Socio-cultural centre in Girona's old district*; by Carles Tuca (ETSAV-UPC, 2011)

4.2.2 New entrance

In contraposition to the ‘city sewing’ strategy, some other students worked on the hypothesis of creating a ‘new entrance’ point to the city, instead of improving access through the narrow historic paths.

The aim was to locate a strategic entrance point in order to reach the highest level quickly and easily, and then facilitate downhill routes, which are notably easier for everybody. It is important to highlight a common situation detected while analysing the cities studied by LOCUS: inhabitants – especially tourists, who are often elderly visitors– usually get tired when wandering around the old city, mainly because of the high slopes and steep steps along the way. For instance, the Cathedral, which is an indispensable site for most visitors, is usually located at the highest point of the city and it is common to see tourists arduously climbing up to it, and then having to walk all the way back down again. Hence, the objective is to bring people directly to the upper part by means of mechanical connections, such as lifts, inclined lifts, funiculars, mechanical ramps, etc. This kind of intervention has the potential of bringing fresh activity to the city and creating a new node of centrality with renewed functionality and services offered to the public, often becoming a touristic attraction that offers new activities supported by leisure services, green areas to rest, etc. The following Fig.15 illustrates an intervention in which –by designing a new mechanical connection as a new entrance to the city, along with the design of a green park equipped with underground parking and public transportation stops– the whole area is regenerated as a new node of public interest.

Figure 15: ‘New entrance’: Installation of an inclined lift in the South part of the Ibiza walls, creating a new direct access to upper Dalt Vila.



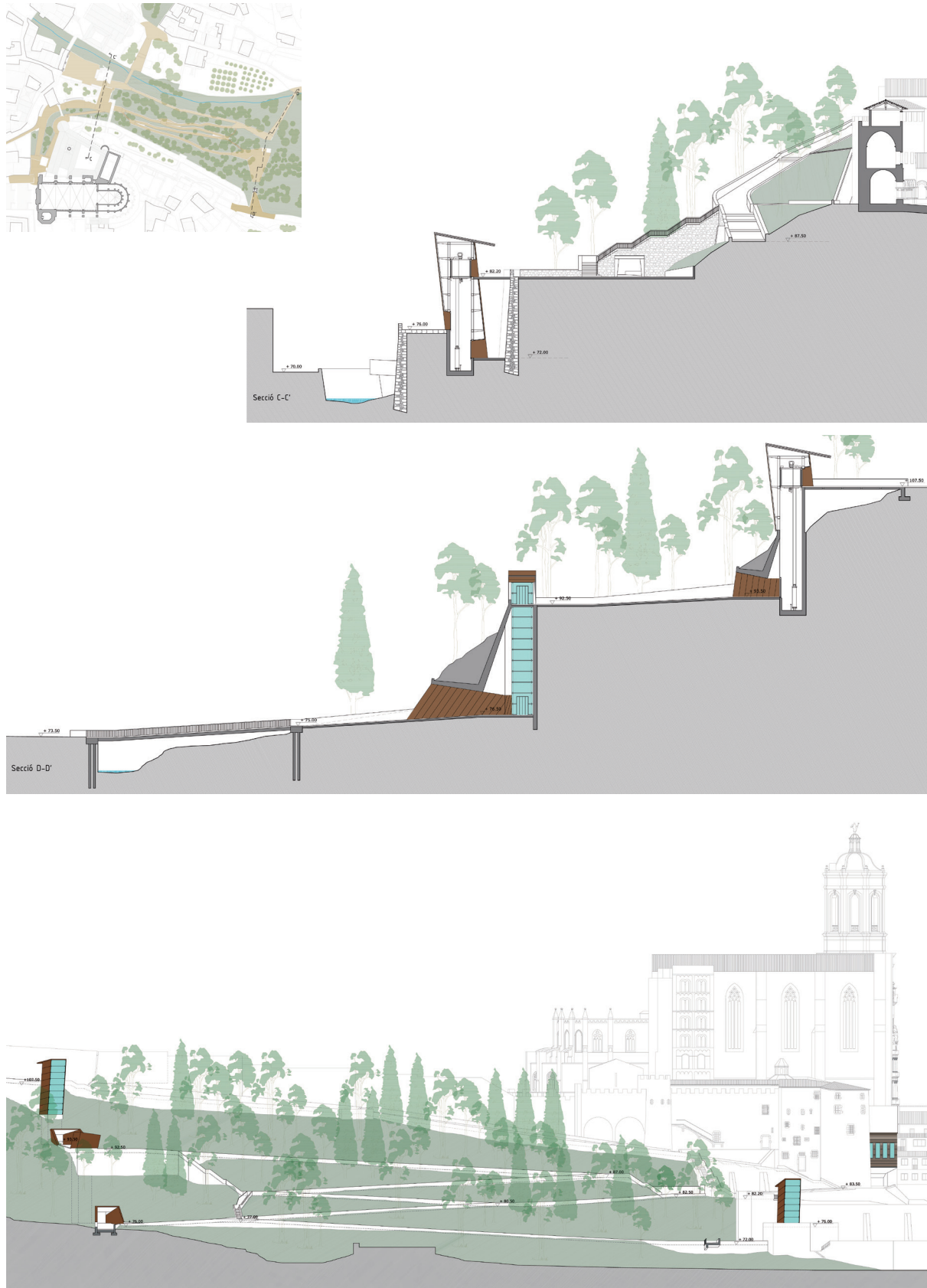
Source: Ibiza G8

According to this ‘new entrance’ exposition, it is worth briefly talking about two projects developed by Sergio García and Eva Pérez, UPC students who participated in the LOCUS-Girona and LOCUS-Évora workshops, respectively, and who afterwards worked in detail on the site as their Master’s Thesis Project.

In the case of Girona, García’s analysis of the city detected an irregular growth towards a steep area located in the north part, beside the Cathedral, which has always been disused and appears as an abrupt end in the city’s growth. This particular character of the area led García to the certainty of having detected the ‘dark point’ where ‘mechanical vertical connections’ are required. The project (see Fig.16) is a global intervention in the public space and consists of connecting, by means of accessible itineraries, four new strategically located lifts: starting from the upper part, the first lift is located next to the Cathedral and provides access to it; the second one is installed in a public garden a little above; and the third and fourth lifts are installed in the forest area nearby, allowing an accessible green path in the woods that finally reaches the modern part of the city at the lower levels. This proposal takes the opportunity to reclaim a residual area and confer significant continuity on Girona urban planning.

Figure 16: Example of Master’s Thesis Project creating a new entrance to the upper part of the city by recovering a residual area





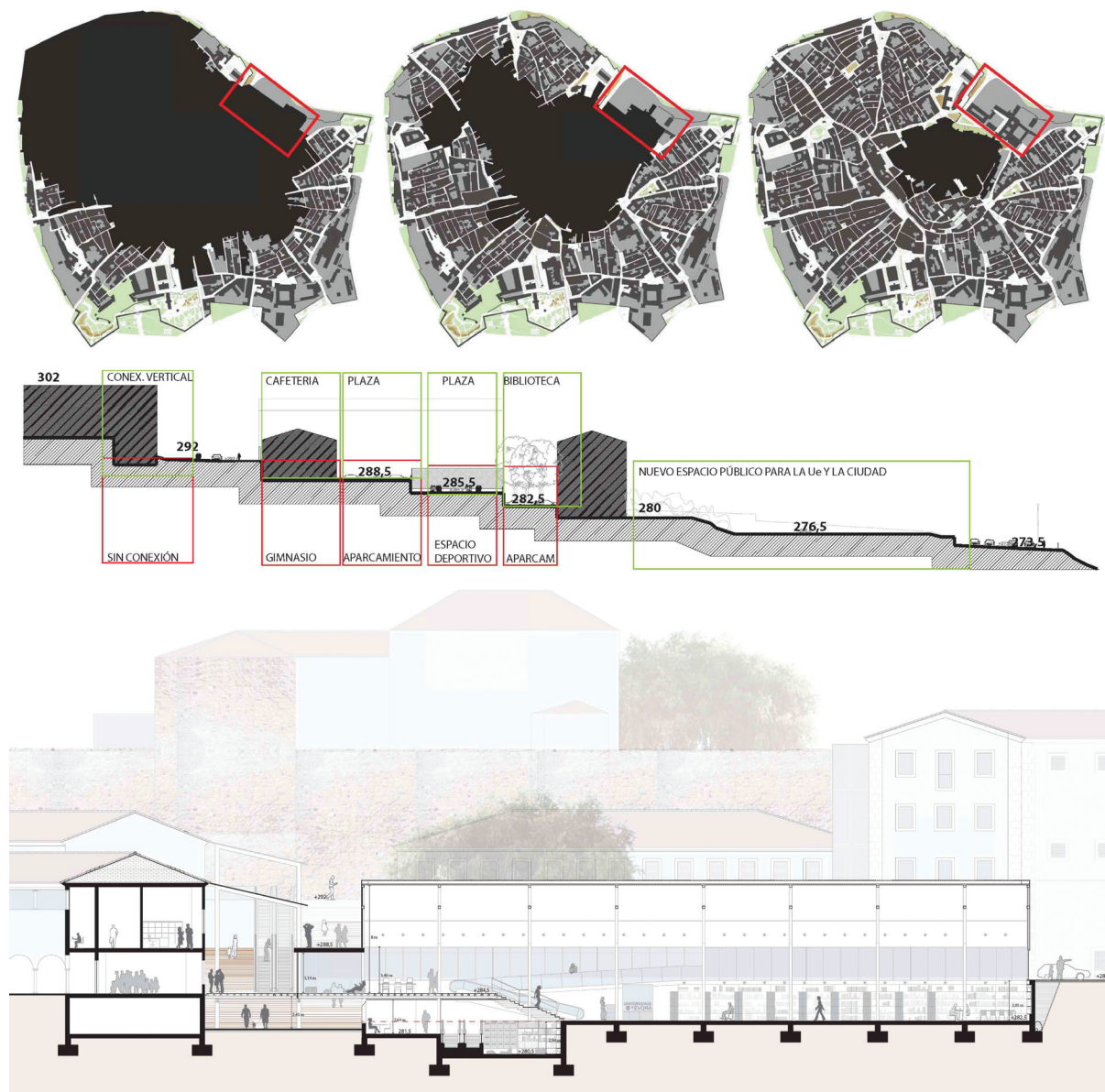
Source: *Project ATH (Accessibility, Topography and Heritage)*; by Sergio García (ETSAV-UPC, 2010)

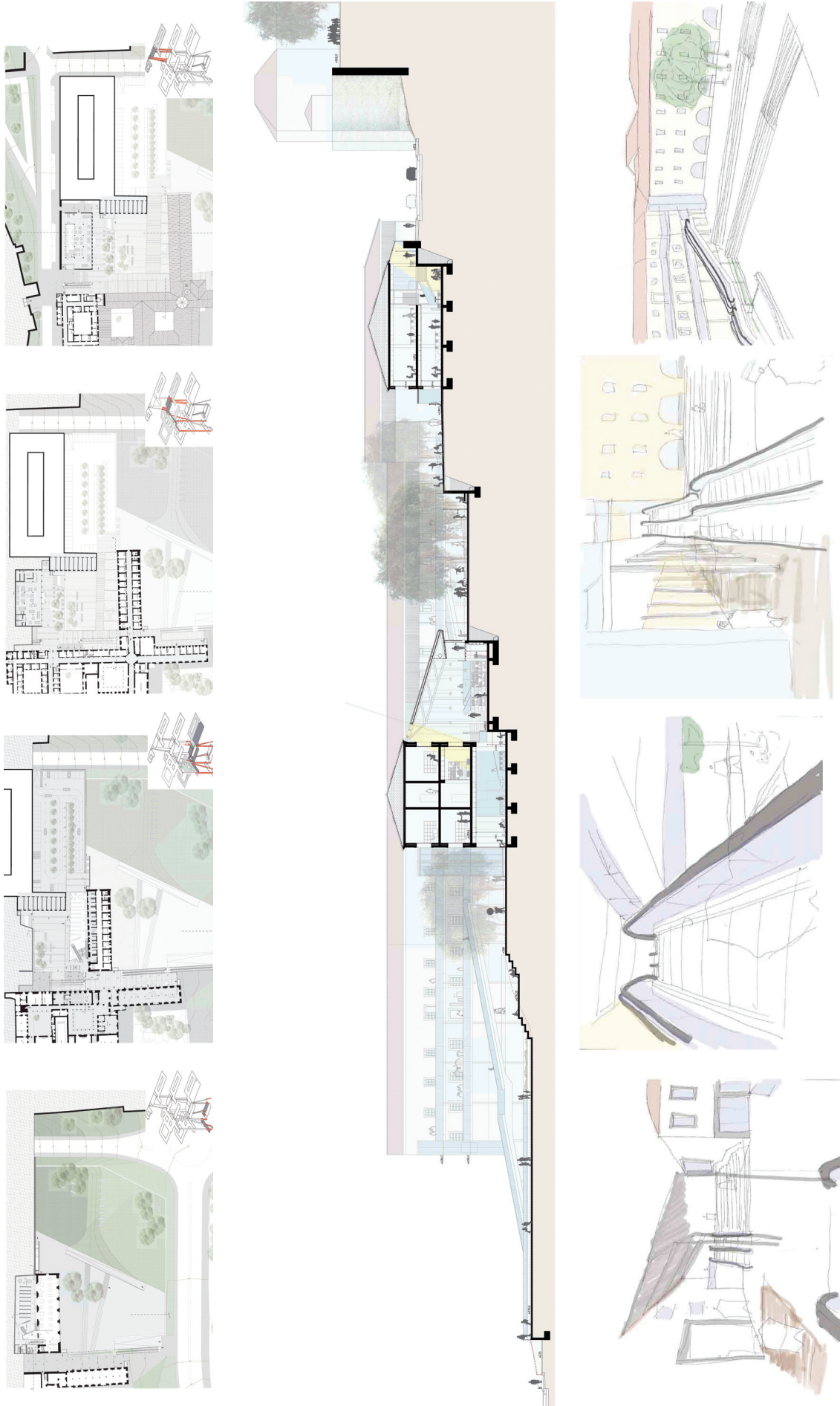
In the case of Évora, firstly it is important to note that, compared to the size of the other three cities studied by LOCUS, Évora presents a much larger historic city centre and, because of that, it was decided to divide it into 9 similar areas, one for each working group of students. Pérez decided

to develop her Master's Thesis Project on sector number 9 (although it was not actually her sector of study during the LOCUS workshop), because it was identified as one of the most interesting sites due to its strategic position in the steepest area of the city, where the greatest height-difference occurs in the minimum ground-distance. Sector 9 corresponds to the University of Évora, which is located between the Medieval wall, at its highest point, and the external ring road, thus facilitating exterior arrival and direct connection to the historic centre. Consequently, it is considered one of the best sites for quickly reaching the highest point of the city, where the Diana Temple stands, one of the most visited touristic attractions of the city.

Pérez's project (see next Fig.17) consists of using lifts and mechanical ramps to combine the interior university path (whose current sloping is around 20% and hardly practicable) with newly created public spaces and services, such as a library or a cafeteria. This new mechanical path is understood as an urban public space, which can be used by inhabitants and visitors 24/7, regardless of whether the surrounding facilities are closed. The accessible itinerary ends at the upper street with a lift hidden in the Medieval wall and which ultimately connects to the Diana Temple.

Figure 17: Example of Master's Thesis Project creating a new entrance to the upper part of the city and becoming a new node of centrality





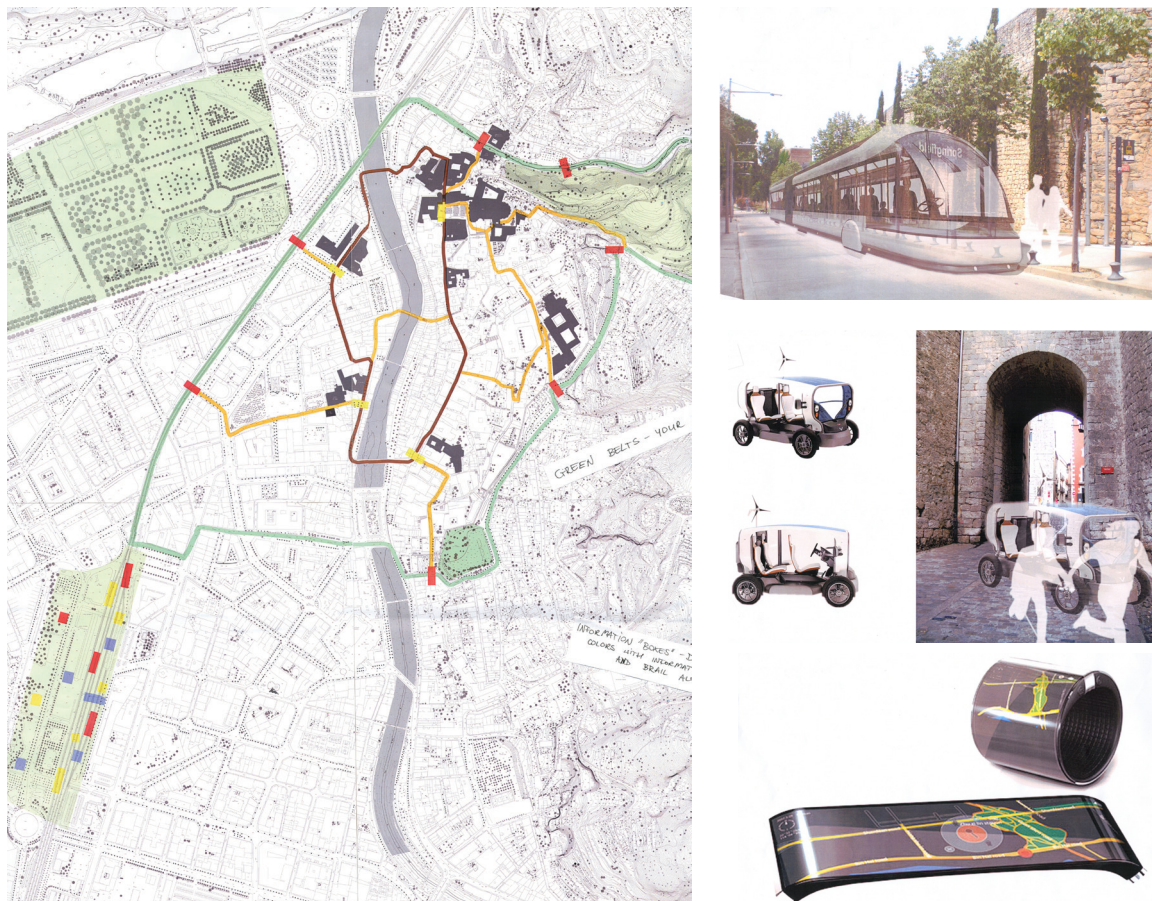
Source: *Inclusive Évora*; by Eva Pérez (ETSAV-UPC, 2011)

4.2.3 Innovative transport systems

First of all, public transportation becomes an essential tool in counteracting the lack of accessibility, because the reality is that historical cities present steep topography where it is not always possible to guarantee autonomous mobility for all users. The aim is to locate the main entrances to the city, points with higher demand on transport, and to identify the main touristic routes of important cultural and historic value in order to study the conditions of mobility. This is fundamental for understanding inclusive urbanism. However, it is a fact that not all standard transport systems can be used in some streets and urban environments, especially the ancient and irregular paths present in historic sites. Through their research in this vein, LOCUS students have proposed designing innovative, smart transport systems which are capable of circulating around narrow streets and carrying people with additional technical aids such as wheelchairs, prams or trolleys.

To illustrate this approach, it is worthwhile to introduce the project that won the second prize in LOCUS-Girona (see next Fig.18). Its main concept is to promote green spaces and public transport by creating and combining two beltways of transportation: 1) the 'Green Belt', an external circulation where electric buses run along the outer limits of the city; and 2) the 'Accessible Belt', an inner transportation network consisting of electric cars that circulate among the emblematic points of the city. Both belts are connected at every station, thanks to a GPS bracelet that passengers wear so that they can locate the nearest electric car available and reserve it. The GPS system is also an aid for helping to navigate the city and not lose one's bearings.

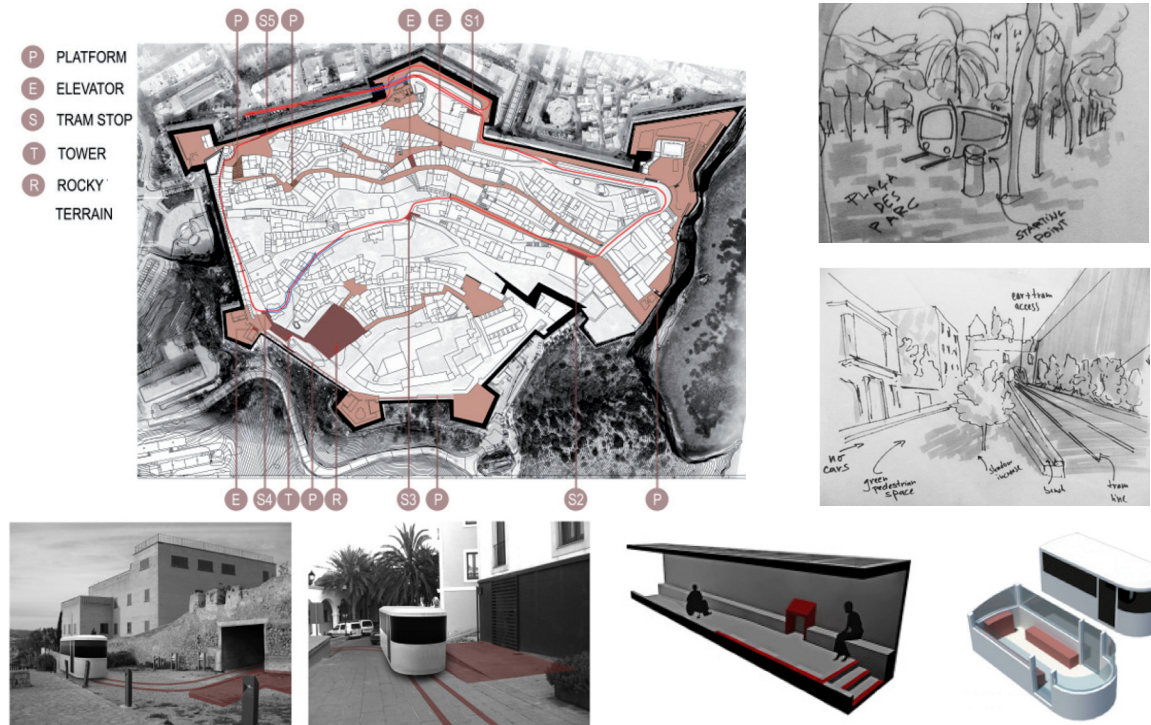
Figure 18: 'Innovative transport systems': Two beltways of transportation combining the use of electric buses and electric cars



Source: Girona G4 - 2nd prize

A similar approach to resolving the accessibility of a city by means of public transportation was followed by a student working group in LOCUS-Ibiza (see Fig.19): Their main concept accurately designed the minimum cabin for a tram and its stop area, dealing with the great difficulty of finding a proper itinerary able to fit such a vehicle within the narrow streets of Ibiza's historic centre, known as *Dalt Vila*. However, it needs to be pointed out that, due to the urban complexity of *Dalt Vila* and the rigidity of a tram system, it was only possible to reach some emblematic destinations and not the whole area of study.

Figure 19: 'Innovative transport systems': Minimum tram cabin to circulate the narrow historic streets

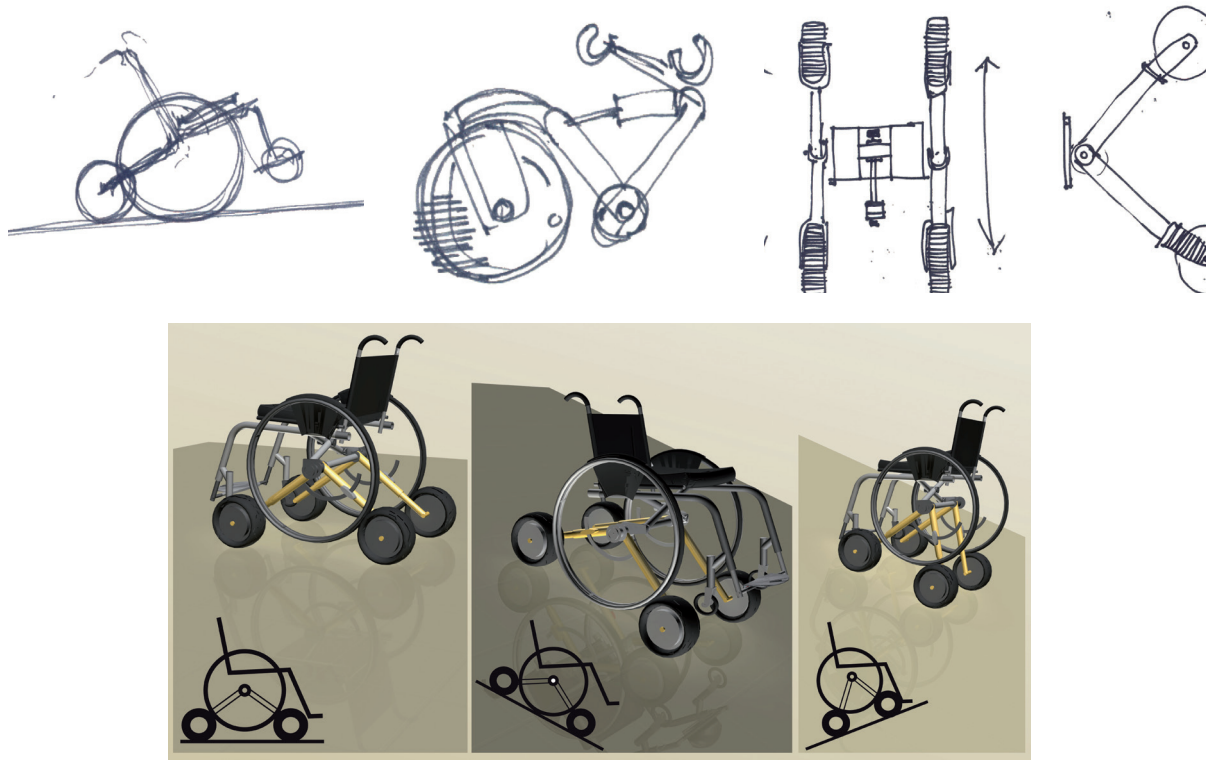


Source: Ibiza G6

Finally, as an alternative to the above proposals, it is worth mentioning the design of a new wheelchair proposed by one working group in LOCUS-Évora (see Fig.20). This group of students argued that public transport is too rigid and often restricted to a fixed route where changes in the itinerary are not possible. Questions such as, 'What if the public transport doesn't reach my desired destination?' led them to design an improved wheelchair 'capable of everything': able to climb stairs, to avoid flipping over when climbing steep streets, even to correct the degree of the seat inclination and/or the user's elevation for his/her maximum comfort.

Figure 20: 'Innovative transport systems': Improved design for a wheelchair capable of circulating highly sloped streets





Source: Évora G6

Although research is admittedly needed for improving wheelchair designs in general, this solution is not a ‘solution for all’ in terms of a city’s accessibility, since it only serves a very particular group of users. Thus, it cannot be considered as a strategy for achieving inclusive urbanism. But it is still worthwhile to introduce this particular perspective on the topic, according to some of the participants.

4.2.4 Multisensory design

At the same time, all these urban strategies must be complemented by a closer scale approach, paying attention to the specific street design: types of paving, transversal slope, urban furniture, etc. It is fundamental that the pavement is suitable and is constantly maintained, because loose, broken, or uneven cobblestones and the like are what cause most falls by pedestrians. Such accidents very often result in serious injuries to elderly people. Pavement is accessible only if it is a flat, hard and non-slippery surface.

LOCUS students concentrated on reducing traffic density in historical areas by giving priority to pedestrian circulation. However, vehicles must be allowed to enter the area occasionally for supply, maintenance, security or emergencies; so strategies are needed to guarantee the security of all citizens, especially the visually impaired. Different textured pavements or selectively located and suitable urban furniture are but two examples. It is important to limit vehicle circulation to ensure pedestrian safety and so that the sidewalks and roads are wide enough for both pedestrians and vehicles. Normally, sidewalks are elevated from the road, which hinders access between both sidewalks. It is also important to notice that street width in historic areas is often irregular; in certain circumstances the sidewalks become narrower and narrower, even to the point of almost disappearing. This is brilliantly illustrated in next Fig.21:

Figure 21: Customary barriers found in historic city centres



Source: Évora G2

For this reason, in areas where the streets are 7m wide or less, one proposal is to elevate the road to the same height as the sidewalk; in doing so, pedestrians may circulate comfortably while at the same time vehicles may feel dissuaded from invading a ‘forbidden’ area where they have to reduce speed and drive more carefully. This solution, however, makes it more difficult to ensure citizen safety because of traffic and pedestrians circulating at the same level. This would especially be the case for visually impaired people, who are used to having a step for knowing whether they are on the sidewalk or the road. Thus, it is advisable to distinguish the ‘safe space’ for pedestrians from the ‘shared space’ with vehicles by combining different textured pavements and/or urban furniture, both of which can be easily detected by hand touch or by cane.

In this respect, it is especially relevant to note the designs produced in the LOCUS-Évora (Portugal) and LOCUS-Ibiza (Spain) editions, because the students in the last workshops benefited from the previous work carried out in preceding editions. Thus, each workshop can be somehow considered as a little step further on the topic. In Évora and Ibiza, LOCUS counted on the invaluable participation on the teaching staff by Carlos Mourão, a blind architect. Students, therefore, not only experienced through the disability simulations what it feels like to be visually impaired, but they also absorbed learning from the direct and real experience of a blind architect. Therefore, a greater multisensory approach in the students’ designs has been clearly detected in general terms, but more especially in LOCUS-Évora and LOCUS-Ibiza, where the proposals of the students were manifestly multisensory.

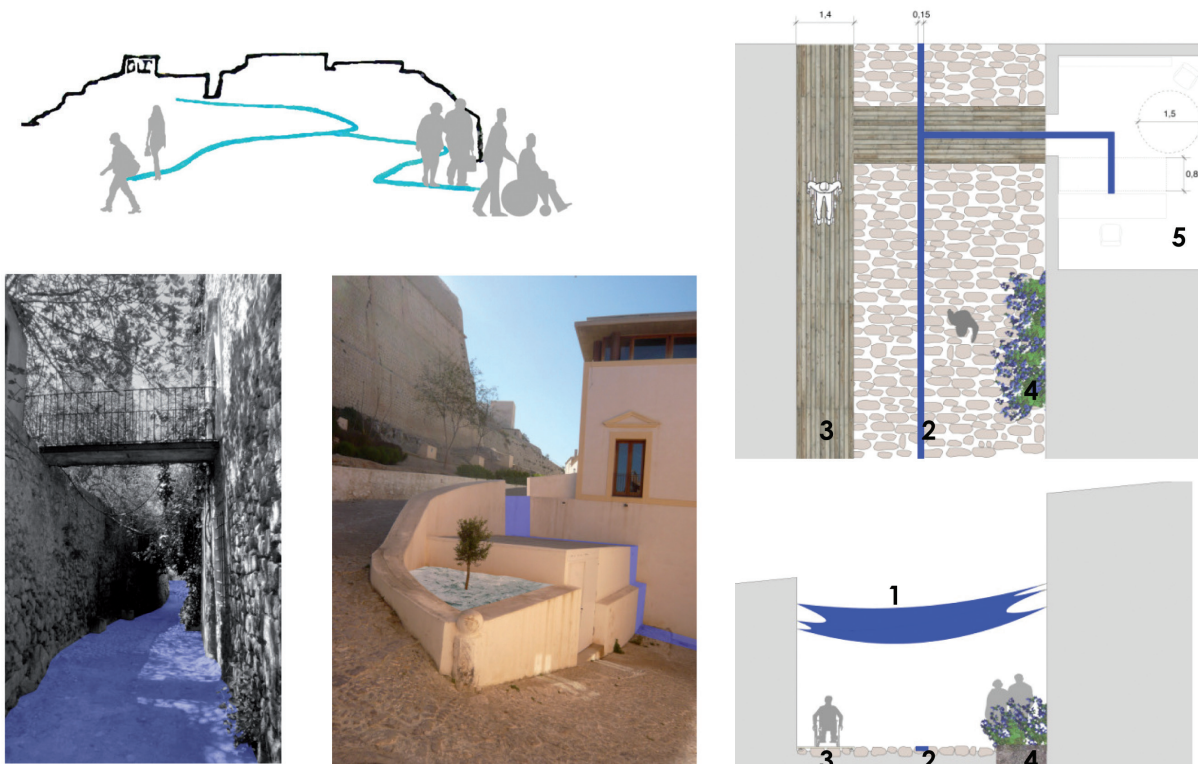
What is more, exploring and taking the multisensory approach to its maximum extent signifies that the resulting designs are no longer destined for a minority of disabled people, but they are architectural design proposals that become largely and fully inclusive. For instance, consider pedestrian areas where people and occasional cars circulate at the same level. Bearing in mind especially visually impaired people, who are used to having a step for knowing whether they are on the sidewalk or on the road, the research on guidelines was promoted in order to particularly ensure their safety as well as the general citizen’s comfort. Among these guidelines aimed at helping visually impaired people navigate, various worthy proposals were made by students (see next Fig.22), such as: installing lights into the pavement for guidance, especially at night time; streams of water for easily identifying accessible paths;

or flowers and other aromatic plants with vivid colours and easily recognisable smells to indicate the way.

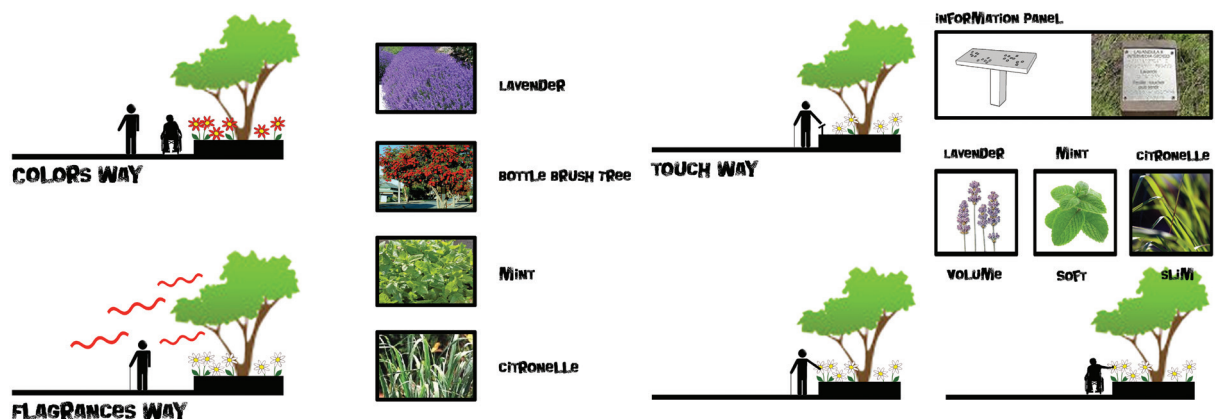
Figure 22: Examples of multisensory design proposals



Source: Ibiza G4 - 3rd prize



Source: Ibiza G5

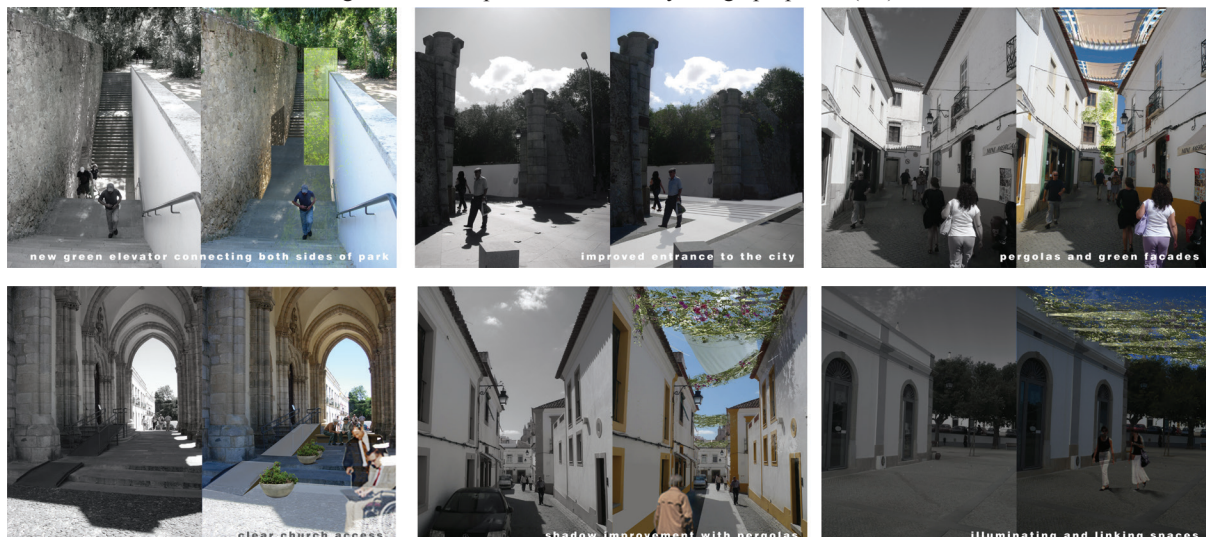


Source: Ibiza G1

Hence, the proposals went far beyond only combining different textured pavements and/or urban furniture that can be easily detected by hand touch or by cane, which is the customary approach. Instead, a greater multisensory architecture was achieved where all the senses were equally engaged. The students comprehended that when compensating for the lack of sight, not only the customary sense of touch must be contemplated, but also smell and hearing can become exceptional tools for navigating space. Furthermore, the different elements used in the designs –water, aromatic flowers, etc.– were not only conceived as a guidance element for aesthetic and/or environmental purposes, but also for the body's pleasure. If a running stream of water is situated along the top of the wall next to the stairs, for instance, the hand can touch it without having to bend down, thus refreshing the body with the feeling and sound of fresh water, which is especially pleasant on hot summer days. The fact that students were actually inhabiting the site under study also allowed a process of designing architecture benefiting from one's own perception, that is, experiencing architecture rather than just drawing it. A good example of it is the winning project of LOCUS-Évora.

Firstly, it is important to note that Évora is an inland Portuguese town with plenty of tourists and very high temperatures, especially on summer days. This working group noticed how the streets become silently empty at noon, when all the local people hide in their homes to avoid the unforgiving sun, whilst the tourists, many of them elderly, remained on the streets searching for some shade to survive. Thus, the winning project of LOCUS-Évora (see Fig.23 next) distinguished itself as a relevant example in globally improving a city's wellbeing by redesigning the urban space and combining four different tools: green areas, pergolas, water, and green facades. The result was a 'city for all', which not only ensured accessible paths, but also enabled enjoyment and peaceful rest in green spaces with water points and shaded areas along the routes. This appeals especially to the elderly, children and pregnant women, while at the same time green façades bring life to the city and its citizens.

Figure 23: Examples of multisensory design proposals (bis)



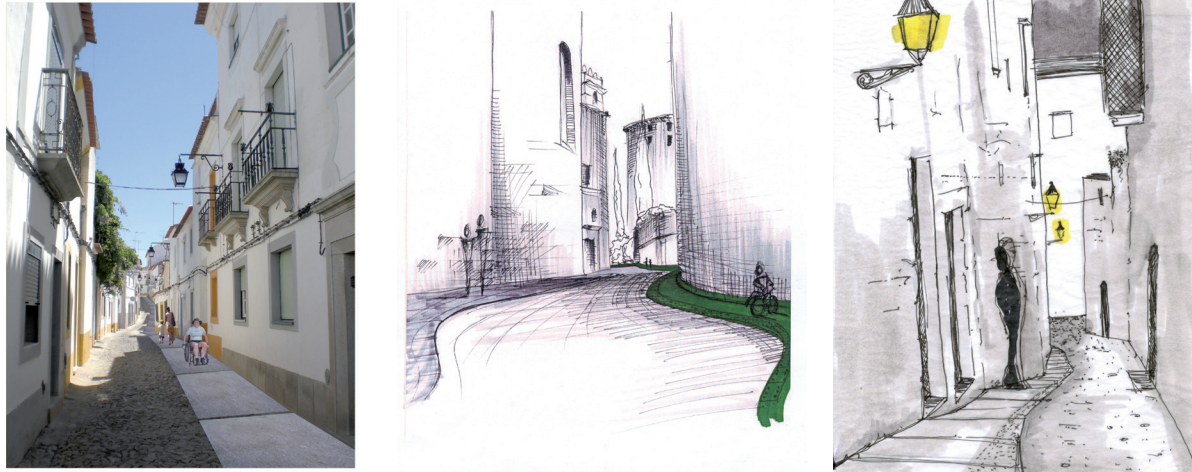
Source: Évora G5 - 1st prize

What is more, after the disability simulation experience, a change of attitude towards how the suppression of architectural barriers must be faced in heritage environments has been detected: The suitability of some existing pavements needs to be questioned and the possibility of replacing them evaluated. In different historic city centres, for instance, we find surfaces paved with pebble stones; the reason for that most certainly goes back to when the horse was a regular means of transport and pebble stones prevented the animal from slipping. This solution made perfect sense then, but does it now? Pebble stones cause people to fall down when the surface is wet, high heeled shoes break easily, the

front wheels of a wheelchair get stuck, blind people feel insecure and lose balance, and so on.

The most repeated proposal given by LOCUS students, most probably after the experience of the disability simulation, has been to replace the uneven cobblestones or pebble stones with new accessible flagstones. Discussion of replacing this pavement sparked a debate on the possible loss of heritage, and for this reason some working groups decided to repave just the minimum area needed for easy and accessible circulation, as the following Fig.24 illustrates:

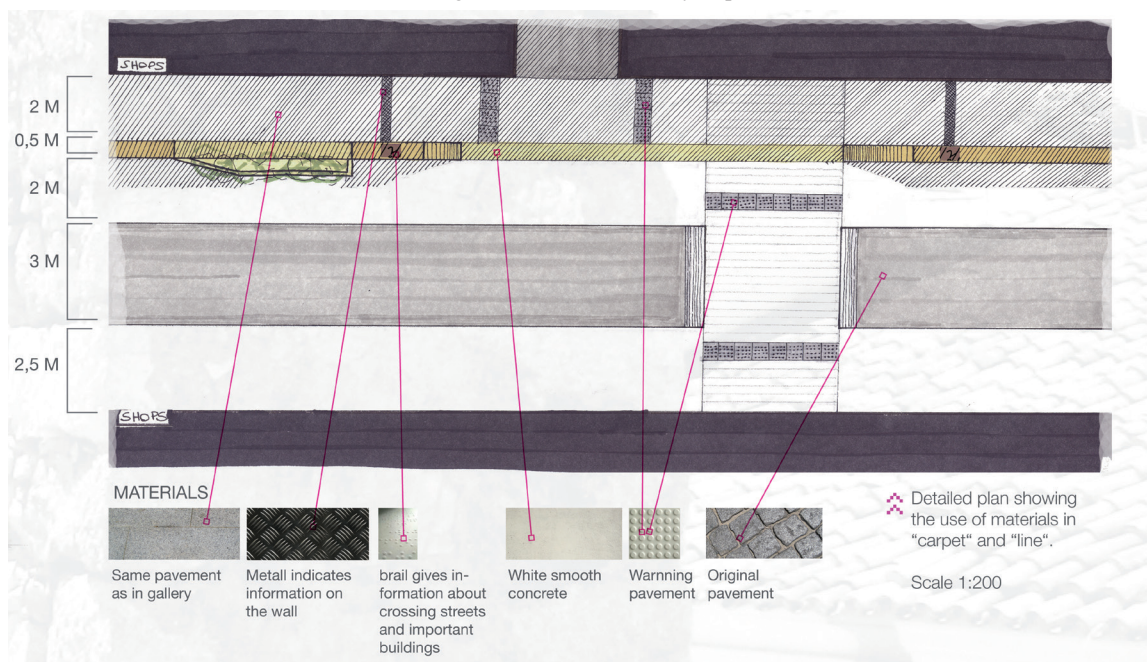
Figure 24: Repaving the minimum area necessary for accessible circulation



Source: (from left to right) Évora G6, Girona G4, Girona G5

In contrast to this proposal of repaving only a part of the street to ensure an accessible path within it, it is worthwhile to highlight the original solution proposed by some students (see Fig.25), which consists of repaving the entire street with new accessible flagstones or similar (flat, hard and non-slippery) and leaving a narrow line of the original historic pavement as a reminiscent trace instead. In this way, the preservation of heritage is achieved, with the simultaneous added value of providing a guideline for the visually impaired.

Figure 25: Repaving the entire street, except for a strip of the original historic pavement, which functions as a historical trace and as a guideline for the visually impaired



Source: Évora G7 - 3rd prize

4.3 Theoretical discussion

4.3.1 On heritage and accessibility

LOCUS IP encourages a general reflection upon the need to renovate our emblematic historic cities and their architecture, in order to return them to their citizens and users. As time goes by, societies prosper and needs change; architecture cannot do anything but move forward with it all. The same occurs in historic cities: most of them originally chose strategic settlements, on top of a hill with difficult access, with the intention of defending against enemies. But defensive walls and controlled entries are no longer necessary; in fact, they contradict completely the desire of all contemporary cities to allow growth and external relationships. This is why we must study our cities in order to allow all the necessary transformations that ensure all users can continue living in their homes, especially the significantly growing elderly population.

A certain sort of ‘museumisation’ is detected in patrimonial cities, where the desire to preserve the heritage at all costs seems to prevail upon people’s rights of free mobility and enjoyment. Daily urban life is minimised because the environment is transformed into pure images only to be admired from a distance, in a kind of simile of frozen heritage as a great sculpture. Indeed, architecture occupies a vague status, halfway between pure art and utilitarian concerns, a dualism that causes great debates that impede decisions on conserving heritage. If we understand the origin of architecture as the purpose to provide shelter for human life to prosper, many questions arise: When did inhabitants stop transforming their environment to adapt it to their own necessities and their own enjoyment? At what point did architecture begin to be considered heritage, converted in the end to artwork which must only be protected and admired but never used? And, if this is the case, are we then looking at architecture or a kind of sculpture? Thus, is architecture pure art?

Many authors have written about the dilemma of framing architecture; is it a pure art or does it go beyond this? The Danish architect Steen Eiler Rasmussen [1964: 9-10] debated this question at length in his book, *Experiencing Architecture*, and it is worth noting some of his considerations, which provide remarkable hints on the topic:

“Architecture, painting and sculpture have been called the Fine Arts, that is to say the arts which are concerned with ‘the beautiful’ and appeal to the eye, just as music appeals to the ear. (...)

The architect works with form and mass just as the sculptor does, and like the painter he works with color. But alone of the three, his is a functional art. It solves practical problems. It creates tools or implements for human beings and utility plays a decisive role in judging it. (...)

In other words, the difference between sculpture and architecture is not that the former is concerned with more organic forms, the latter with more abstract. Even the most abstract piece of sculpture, limited to purely geometric shapes, does not become architecture. It lacks a decisive factor: utility.”

Kahn [1961: 116] also expressed this idea of ‘utility’ in his own words in the early 60s: “A painter can paint square wheels on a cannon to express the futility of war. A sculptor can carve the same square wheels. But an architect must use round wheels.” Already in the beginning of the 20th century, Loos expressed a similar idea about the difference between art and architecture based on the ‘utility’ factor: “A work of art is a private matter for the artist, a building is not. A work of art is brought into the world without there being a need for it, a building meets a need. A work of art has no responsibility to anyone, a building to everyone.” Only admitting that “a tiny part of architecture comes under art: monuments. Everything else, everything that serves some practical purpose, should be ejected from the realm of art.” [Loos, 2007: 82-83]

Accordingly, functionality (i.e., usefulness) is an essential characteristic of architecture. It took on a minor role between the Renaissance and the Industrial Revolution, giving more priority to ‘character’, which “refers to the meaning of a place or object –its significance.” [Steinfeld and Maisel, 2012: loc.976] Indeed, the concept of heritage emerged in the late 18th century, when the first law for the preservation of heritage was passed in 1790 during the French Revolution. Prior to that date, the notion of heritage conservation did not exist: everything used was kept, naturally, or it was appropriately modified to better suit changing needs. Meanwhile, everything that was unused or that had fallen into oblivion was simply discarded [Garcia-Fuentes, 2010: 1321]. Indeed, the nature of any inhabited environment (excessively called ‘heritage’ nowadays) is that it is in a constant state of change, like a house is naturally transformed after new-borns arrive and others leave or pass away. Architecture must maintain its inherent process of transformation over time, to respond to its original purpose of serving society and its current needs. As Rasmussen [1964: 10-11] pointed out, it is important to consider:

“That which may be quite right and natural in one cultural environment can easily be wrong in another; what is fitting and proper in one generation becomes ridiculous in the next when people have acquired new tastes and habits. (...) In the same way, it is impossible to take over the beautiful architecture of a past era; it becomes false and pretentious when people can no longer live up to it.”

This way of thinking should guide us on how to approach the matter of heritage, because historic preservations will be used only if they are rectified and made accessible, thus ensuring that a place’s history and identity will be passed down through generations. Citizens need to re-conquer heritage and encourage the natural process of adapting to the demands of contemporary users, thereby integrating it into present social life. Nowadays, indeed, we are experiencing some kind of “discontinuity in our culture; the past is preserved but not made part of the future (...) architecture, like literature and landscape, is part of our collective memory, which we must incorporate into our present experience” [MacCormac, 1996:81]. In order to do this, we must accept that some changes are inevitable, that alterations are natural and should be a welcome requirement for prosperity and survival. Altering, changing, transforming: these actions naturally entail some kind of loss, a process of releasing, of forgetting. The French ethnologist Marc Augé [2004: 17] explains how forgetting propels us into the present, how “to live again and not just survive”. In an illuminating comparison with gardening, he states: “Remembering or forgetting is doing gardener’s work, selecting, pruning. Memories are like plants: there are those that need to be quickly eliminated in order to help the others burgeon, transform, flower.”

Many architects and thinkers have approached this question of transformation, notably the Portuguese architect Alvaro Siza, who is a sculptor as well. By reflecting on the condition of architectural form, Siza [2008] conceives form in architecture as an endless process, something always open to transformation; and he asserts, as well, that it should not be a sculpture for demonstrating the architect’s talent. Hence, architecture –including patrimonial architecture– cannot be treated as a closed art, such as painting or sculpture, where the masterpieces have a clear beginning and end in the creation process.

Nevertheless, the truth is that the preservation of heritage can be like a field of quicksand and the general attitude is to be very cautious about not inciting a battle of opinions. Evidence to this fact is the answers of the students surveyed about the common attitudes towards historical places. In the previous questions presented, the results more clearly supported or rejected the different statements. In this case, almost all the given options remain around 3 out of 5, that is, neither agreeing nor disagreeing with them. The following Tab.2 displays diverse beliefs on heritage preservation and, once more, the concepts have been ordered according to their average ranking after processing all the student surveys. An additional row for each option shows the real number of participants grading each question,

highlighting in red the most valued ones in each level of agreement.

Table 2: Enquiries on heritage and accessibility

| | Disagree..... Agree | | | | |
|--|---------------------|--------------|--------------|--------------|--------------|
| <i>Heritage must always be equally and universally accessible</i> | 1 | 2 | 3.99 | 4 | 5 |
| | 3/75 | 6/75 | 14/75 | 18/75 | 34/75 |
| <i>Transforming architecture to our current needs has always been a natural response of humankind</i> | 1 | 2 | 3.85 | 4 | 5 |
| | 3/75 | 4/75 | 22/75 | 18/75 | 28/75 |
| <i>Giving access to heritage should not mean making alterations to its original state</i> | 1 | 2 | 3.49 | 4 | 5 |
| | 5/75 | 7/75 | 23/75 | 26/75 | 14/75 |
| <i>Historical places are charming and we must preserve them as they are as exactly as possible</i> | 1 | 2 | 3.19 | 4 | 5 |
| | 12/75 | 10/75 | 19/75 | 20/75 | 14/75 |
| <i>Nowadays we protect architecture because it is old and not necessarily because it has architectural value</i> | 1 | 2.49 | 3 | 4 | 5 |
| | 21/75 | 17/75 | 20/75 | 13/75 | 4/75 |
| <i>Our understanding of heritage is overestimated and we should protect more modern architecture as well</i> | 1 | 2.25 | 3 | 4 | 5 |
| | 18/75 | 29/75 | 13/75 | 11/75 | 4/75 |

Source: Own elaboration based on LOC/TUS surveys

However, 61.5% (46 out of 75 students) asserted that their perception towards heritage has changed after LOC/TUS IP; some students even expressed their strong belief in certain positions, such as the following: *‘The architectural value of heritage must come second place to accessibility!’* Although, more precisely, the most frequent reactions acknowledged a change of values and understanding, as well as addressing how to do it.

‘I never thought about the rights of architects (or governments) to alter cultural heritage. The preservation of historical places / buildings was something absolutely obvious to me. The needs of the disabled never really came to my mind before, at least not concerning the accessibility to heritage. Providing equal chances and abilities to the entire society is a very challenging matter for architects / designers. The whole issue should not be a question of regulations, but of social empathy and of course smart design.’

‘Most of the historical centres that we cherish today and appreciate have been conceived as inaccessible. It is very interesting that, by making them more accessible, even with very discrete interventions, we can totally change and, in a way, upgrade them, make them more contemporary (not in style but in use and atmosphere).’

Unavoidably, the spiritual meaning of climbing was also discussed during LOCUS workshops, since accessibility was the main end while also maintaining the target of keeping the charm of heritage. To reach the Cathedral at LOCUS sites was clearly difficult, for instance, and the possibility of installing a lift or other similar mechanical vertical connections was debated in order to keep the ‘pure’ emotions of climbing.

On the one hand, the act of climbing has a spiritual value, almost a ritual significance. Bloomer et al. [1977: 86-88] provide a good illustration of it:

“The temple complex at Monte Alban in Mexico seems to have been built around the act of climbing (...) To arrive at the largest temple one went up, then down, then up, then down, then farther up again (...) made the act of walking up and down and lingering so absorbing that the goal, the place, is subsumed in the path; getting there is all the fun.”

In this regard, it is also worthwhile addressing the particular view on stairs by American architect Philip Johnson. In his writings, he complains how the experience of climbing stairs seems to disappear in modern architecture, and what a pity it is that the large increase in the population has converted the stately staircase into something obsolete. Apparently, Johnson was still attached to the hidden, subconscious meaning of stairs that is often associated to the noble or to the gods, with hundreds of temples preceded by endless steps to support this assertion as examples. However, by reading carefully Johnson’s [1979:147] texts, what he actually admired about stairs is the experience produced by the ascending movement:

“The stairs can be connected to feeling the change during the ascension. What is important is what happens during this process: the curiosity of knowing what I will find up there? The crucial point is the velocity of ascending, which must be slow allowing perceiving all the changes. We can reach the same goal with a ramp of a gentle slope, ideally following a winding course, so the destination can be seen from different points of view offering changing perspectives (we should never approach a building upfront, the diagonal offers the building in a perspective of depth). Or even with a spacious, clean and slow glass elevator. Architecture is movement.”

Therefore, what really matters is to control the process of movement and the sensations evoked, and not place so much importance on the self appearance of the element at issue: the experience of changing directions along the ascent, the velocity of the rise, the need of time to take a look at what is happening around oneself during the climb, the curiosity awakened from sporadic glimpses of our destination, and the inexorably arising question ‘what will I see from up there?’ That is, the beauty of architecture also resides in how we experience the movement, where spaces are slowly revealed; e.g., spaces that enter and exit the building, ascending and descending, blocking the view, or the experience of a dark passage to suddenly arrive at a lighted central space. In other words, the process of movement when approaching a masterpiece of architecture, as well as the circulation within it, is fundamental to experiencing the charm of the built environment.

More importantly, in the present dissertation, Johnson also admits the possible comfort offered by a clear and spacious lift that is gently moving, acknowledging that it can also provide a pleasant feeling during the ascent. What worried him about the use of lifts is that all the process of movement when approaching your destination ends at its doors, and there is no physical movement anymore. But a panoramic glass lift can solve this interruption of the architectural experience, since it allows us to ‘see’ the movement and, furthermore, it can be used as an interesting contrast between the fast and the slow. Indeed, architecture is a game of contrasts, as Rasmussen [1964: 29] points out: “Most buildings consist of a combination of hard and soft, light and heavy, taut and slack, and of many kinds of surfaces. These are all elements of architecture, some of the things the architect can call into play.” Hence, if architecture is a playful contrast of light vs. dark, of narrow vs. wide, soft vs. hard; why not also emphasise slow vs. fast? These contrasts can also trigger the experience of ‘pure’ emotions during climbing.

On the other hand, it is also important to comprehend that these ‘pure’ emotions can be very differently felt by one person or another, and even differently felt by one single person in different moments of his/her lifetime. Canter [2001: 51] provides a good illustration of how pure emotions depend on the personal circumstances and interpretation:

“The delicious taste of a simple apple when it is eaten at the top of the hill opposite, after the rugged exercise of climbing up there, has similar aesthetic qualities to a carefully prepared sit-down meal in a grand restaurant. The experience may be modified by what happens before or after it, but the actual nature of the experience itself may have similar properties. This really relates to whether there exist some ‘pure’ emotions that are then labelled to take on different meanings, as many psychologists believe. (...) The physiological reaction may be the same for both feelings but it is the interpretation I put on my circumstances that creates the different emotions.”

What is more, the perception of aesthetics and comfort are intertwined: “Is a warm bath after a day roaming the hills in the rain an aesthetic experience? (...) Are these to be compared with listening to a late Beethoven quartet or looking upon Picasso’s *Guernica*?” [Canter, 2001: 52]

Therefore, the meaning of climbing depends on the personal interpretation: if the process means a fair fatigue, which is completely rewarded when reaching the top, then it can be described as a ‘spiritual climbing’, with significances of overcoming, reward and transcendence. In contrast, if climbing supposes an extreme exhaustion, not enjoying the path but worrying about it, not admiring the landscape but staring at the ground and being careful to not trip over it, then there is no reward at all, and the process becomes a ‘suffering climb’. Thus, for many people –elderly, parents with children,

pregnant women, wheelchair users, the temporarily injured, etc.— the possibility of being assisted by a mechanical lift, preferably one made of glass allowing us to admire the beauty of the ascent, can also be an aesthetic experience, since the final destination is reached avoiding the pain caused by extreme difficulties, but in a state of comfort instead. The aesthetic, pleasant and enjoyable experience is comparable to some extent to the mixed feelings of satisfaction and relief that an athletic person can feel when climbing the heights of the city to discover the hidden charming spots on the way before finally reaching the Cathedral at its highest point.

What is more, it is important to be aware that people naturally gravitate toward an easy life, simplifying efforts and choosing what does not require excessive and repetitive actions. In this sense, when providing strategically located lifts in steep environments, it is not fair to say that they are meant only for the handicapped, because the truth is that everyone takes advantage of them. In fact, the solution of installing lifts in existing buildings or empty spots strategically located in historic city centres (the ‘city sewing’ concept described by LOCUS) appears to be one of the best answers for improving urban mobility connections while maximally respecting the integrity of the city’s heritage. This procedure is indeed reproduced in similar ways in several situations, such as the ‘acupuncture’ intervention in the city of Ripoll (Spain), which won the award *Premio Imsero Infanta Cristina 2008*. There, a rehabilitation project took advantage of an empty plot to construct a lift-building to improve the connection between the historic centre and the Sant Pere district in the lower area. The intervention was created in a vivid red colour (see Fig.26 below), making it easily recognisable from long distances, and was qualified as an element for the integration and circulation of all the citizens, providing easy access to everybody, especially the mobility impaired.

Figure 26: Example of ‘City sewing’: Lift installed in an empty plot to connect neighbourhoods



Source: Ripoll, Spain [Own material]

Examples of such ‘city sewing’ interventions can be found in many cities indeed, where the challenging topography of the place requests the installation of lifts strategically located to ease urban mobility. Such lifts are often installed by taking advantage of a building open to the public in a doubly

beneficial interchange; i.e., people benefit from having an easy ride to the top, while the building profits from having people coming to their installations. Fig.27 provides some random examples of lifts installed in a Tourism Office (images above) and in an office building and commercial centre (images below); both link to the upper part where major attractions of the city can be found:

Figure 27: Examples of ‘City sewing’: Lifts installed in public buildings to connect neighbourhoods



Source: (above) Lisboa, Portugal; (below) Argelès-Gazost, France [Own material]

In contrast, on other occasions the lift is conceived from the very beginning as an architectural masterpiece in itself, and/or has become a major touristic attraction as a consequence of the magnificent panoramic views that can be enjoyed from its top, even though it still aims to connect different neighbourhoods. Many examples can be provided, such as (but not limited to) the Santa Justa lift in Lisboa (Portugal), the Begoña lift in Bilbao (Spain), or the Lacerda lift in Salvador da Bahia (Brazil), illustrated in Fig.28 below.

Figure 28: Examples of ‘City sewing’: Lifts becoming major touristic attractions



Source: (from left to right) Elevador de Santa Justa, Lisboa, Portugal; Ascensor de Begoña, Bilbao, Spain; Elevador Lacerda, Salvador da Bahia, Brazil [Own material]

To conclude, we will achieve a higher quality of life and feel that life is good in our cities and buildings only when we get rid of certain excessively conservationist attitudes and allow the transformation of our built environment to suit our current needs. Thus it has always been and thus it will always be. We need only to take a look at how our old buildings were once lit by candles and/or oil lamps and consider that they are now lit by electrical installations. Or how, at one time, residents had no other choice than to do their business outdoors while thankfully all buildings now have indoor plumbing and sanitary facilities. Without much regret, we have accepted the existence of modern, non-aesthetic elements like fire extinguishers in historical dwellings for reasons of safety. Why, then, does public opinion bemoan the installation of a lift or a suitable ramp in certain patrimonial environments? Indeed it is an unavoidable question to ask ourselves: Why do we seem reluctant to accept mechanical ramps, lifts or any other technological device for facilitating vertical connections in certain environments? Why should we not embrace new technology equally for improving urban connections?

Maybe it is due to purely selfish or naïve reasons; as Steinfeld and Maisel [2012: loc.375] claim: “Sometimes they [people] accept barriers for some people but not for others.” People accept without much controversy the existence of new (and compulsory) elements, such as fire extinguishers in protected heritage environments, because everyone has equal benefit from safety measures in the event of fire. Instead, when talking about solving architectural barriers by installing a lift, for instance, ‘apparently’ only a few profit from it. ‘Apparently’, because there is a common tendency to deny disability, the inevitable reality of ageing, the progressive decrease of our abilities. Our subconscious mind is always thinking: *‘This has nothing to do with me’*, or *‘It will never happen to me’*. The intention here is not to enter into a thoughtful philosophical reflection or a statistical study which proves that everyone, at one time or another, will encounter mobility or sensory impairments, that they will one day lose their bearings or not be able to access a certain desired activity. What is very important to remember is that eventually we all, in one way or another, will be equally satisfied by a barrier-free environment.

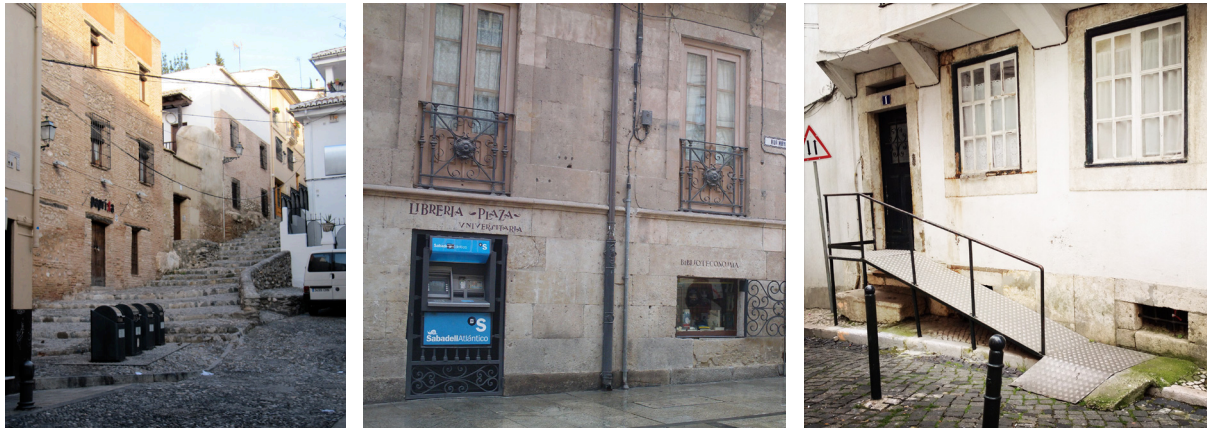
Urban heritage will only be sustainable if we allow the necessary process of transformation, that is, the safe path towards sustainable preservation is the one that allows certain modifications to facilitate its use. The only fully preserved architecture is that which is still used, useful, and which respects the original will of all construction, that is, to serve for what it has been created. Nevertheless, it is important to recognise that accessibility has unbreakable limits too, and these must also be accepted naturally. We cannot pretend to make everything accessible; Everest, Machu Picchu or the Egyptian pyramids, for instance, cannot be adapted. Perhaps, we could base our ideas on Loos’ previously quoted definition of architecture, which only admits architecture as an art when it does not serve any practical purpose, like monuments, and rephrase it to the current dissertation:

Only a tiny part of architecture is exempted to be accessible: monuments, often funerary, religious, or memorial; which are more close to sculpture as pure art than architecture meeting common needs. Everything else, everything that serves for some practical purpose open to the general public, should be required to be accessible, in an equal and sustainable manner.

This being said and going back to previous discussion on the preservation of urban heritage, we should understand the suppression of architectonic barriers as a natural process of transforming heritage. Accessibility should be the new contemporary layer that coexists in harmony with earlier ones (see Fig.62), in the same manner that we have allowed new elements to be introduced into our buildings. Indispensable elements –such as electrical installations, sanitary facilities and safety devices– for carrying out our contemporary daily activities have all appeared without polemic. We have also allowed our cities to be transformed by new elements that did not exist in the past, such as electric cables and

streetlights, traffic signs or recycling containers. In fact, new elements to improve accessibility in the private realm are introduced without so much hesitation, as the left image in Fig.29 illustrates:

Figure 29: *Accessibility = New contemporary layer*: Introduction of new elements to improve life such as, (from left to right) garbage containers, cash dispensers or ramps



Source: (from left to right) Granada, Spain; Salamanca, Spain; Lisboa, Portugal [Own material]

Finally, if accessibility must appear as the new contemporary layer coexisting in harmony with earlier ones, the duty of the architect is to establish this dialogue between ancient and contemporary in the most natural, aesthetic and integrated way. In the words of Gadamer [2013:156]:

“In fact the presence of great architectural monuments of the past among the buildings erected by the modern world of commerce poses the task of integrating past and present. Works of architecture do not stand motionless on the shore of the stream of history, but are borne along by it. Even if historically-minded ages try to reconstruct the architecture of an earlier age, they cannot turn back the wheel of history, but must mediate in a new and better way between the past and the present. Even the restorer or the preserver of ancient monuments remains an artist of his time.”

4.3.2 On normalizing diversity

Concerning the task of solving accessibility in patrimonial environments, the procedures cannot be strictly based on the specific regulations of specific cities, because the regulations incoherently change from one region to another. They should be focused on what can be called ‘user-centred design’ instead.

Furthermore, according to many Accessibility Codes, we are not always forced to strictly follow the law in historical areas; alternative solutions can be accepted. For instance, the Catalan standards for accessibility [*Codi d’Accessibilitat de Catalunya*, 1995] state that the design of adapted paths in existing centres and protected natural environments admits alternative solutions, if the competent organism for this topic approves the project. The Government of Ireland similarly asserts in its *Disability Act* [2005: article 29.1.] when dealing with *Access to heritage sites*: “The head of a public body shall, as far as practicable, ensure that the whole or a part of a heritage site (...) is accessible to persons with disabilities and can be visited by them with ease and dignity.” An added note states that this shall not apply if its application would “compromise the characteristics of the site.”

Therefore, if we can accept ‘alternative solutions’, and ‘as far as practicable’ but without compromising the site’s charm, it is absolutely fundamental to fully understand the multiple needs of different users, and their whys and hows: For architects and architecture students, it is not about memorising codes and rules (useful spaces, minimum widths, turning areas, maximum ramp slopes, etc.); but understanding how an impaired person moves and interacts so that we can find logical solutions to the problems. It is about comprehending the requirements in order to be able to apply logic and common sense to any situation, because each conflict has its own solution, which is often singular and distinctive.

According to Bernadi and Kowaltowski [2010], the active participation of users with disabilities increases students' sensitivity and ensures that future professionals gain a deeper understanding of the spectrum of a user's special needs. LOCUS shared this idea from the beginning and, furthermore, aimed to evaluate the point to which this claim is true and which methods can be used to boost its outcomes:

On the one hand, it is worth noting that, among the LOC/TUS participants, 3 wheelchair-users and 1 deaf student participated in the different workshops. What is more, in relation to the mobility impairment needs, the teaching staff included Fany C  r  se from the *  cole Nationale Sup  rieure d'Architecture de Montpellier* (ENSAM), who was heavily pregnant in LOCUS-  vora and became a pushchair-user in the following LOC/TUS editions, as well as her husband Ankel C  r  se, who was also part of the teaching staff. In addition, I myself was also part of the teaching staff, as a wheelchair-user. Concerning the sensory impairments, Carlos Mour  o Pereira also participated. He is an architect who became blind in 2006 and, rather than discontinuing his professional activity, has continued in his architectural practice and expanded it into teaching and research. Mour  o, who is presently developing his PhD Thesis in Architecture in the *Instituto Superior T  cnico* in Lisbon, joined the programme as an expert and delivered specialised lectures on the topic. He collaborated as a visiting professor, spending a few days in the 3 out of 7 workshops assessing the students and correcting their proposals.

On the other hand, the participation of disabled users in the academic context is highly recommended, especially when researching on architectural accessibility, as the LOC/TUS IPs intend. However, we must accept that it is obviously not always possible to ensure such participation. Consequently, alternative methods must be explored: LOCUS approached this matter by organising a simulation of disabilities directly on the site. Immersion into the subject through role-playing is one of the best ways to understand how architecture should be accessible. By experiencing first-hand the consequences of being impaired, the needs and obstacles of an impaired person are understood and assimilated much better. The different motions are internalised, the problems identified. Participants experience what can be done, what not, and, above all, why. Quoting the words of Benjamin Franklin: "Tell me and I forget. Teach me and I remember. Involve me and I learn." To back up this assertion, let us look at some of the students' statements compiled during the survey's analysis:

'Sometimes, you think you know, but you don't have an idea of the meaning of being disabled. My own experience of being the "same" as a disabled person really changes everything.'

'Now I can understand their discomfort in moving because I experienced a disability simulation so I try to design thinking about this.'

'I better understand what they need and why they need what they need.'

'Now I understand better their architectural needs.'

'I started noticing more details which have an influence on the standard of life of disabled people'

'Nothing better explains the difficulties connected with various disabilities than such simulation/practice exercises.'

On the first day of the workshop, all the participants experienced the difficulties of mobile or sensory impairment (see Fig.30 below): In the limited mobility simulation, they moved around on crutches or sat in a wheelchair; in the visual impairment experience, they tried to get oriented when walking around wearing low-vision glasses, or using a cane if experiencing complete blindness; in the low-hearing simulation, they moved around wearing ear defenders; and in the elderly simulation, students wore a special suit designed for this purpose, which limited their flexibility and/or restricted one or more extremity's movement, and which was also complemented with some of the above tools (low-vision glasses, acoustic earmuffs, etc.).

Figure 30: Disability simulations: mobility impairments, visual impairments, elderly simulations



Source: (from top left to bottom right) LOCUS- Évora; LOCUS-Girona; LOCUS-Ibiza; LOTUS-Sète [Own material]

The objective of carrying out disability simulations is to allow participants to experience the impairment and the diversity of the needs of the population first-hand, because putting oneself into another person's shoes is a method for intuitively finding out what is lacking in many current designs, as well as how inclusive solutions are the answer. The participants valued this experience in the surveys, through several questions addressing the methodology and the outcomes. The analysis of these and the most relevant remarks given by the students are presented next.

Firstly, the students were asked to evaluate the experience of participating in a disability simulation by grading their level of the agreement with different statements (see Tab.3 below). The different concepts are ordered according to the resulting average ranking. In addition, a second row has been added for a deeper understanding, showing the real number of students grading each question out of the total of 75 respondents. This second row showing the real number of replies within each concept is in grey letters, except for the most valued for each level of importance/agreement (1= irrelevant/strongly disagree vs. 5= very important/strongly agree), which are highlighted in red to facilitate a better reading and with the aim of searching for maximum coherence.

Table 3: Enquiries on the experience of disability simulations

| | Irrelevant.....Important | | | | |
|---|--------------------------|------|-------|-------|-------|
| | 1 | 2 | 3 | 4.6 | 5 |
| <i>It increased my understanding of the spectrum of the user's needs</i> | 1/75 | 0/75 | 4/75 | 18/75 | 52/75 |
| <i>It opened my eyes in relation to the need to suppress architectural barriers</i> | 1/75 | 2/75 | 9/75 | 12/75 | 51/75 |
| <i>It changed my architectural design into a more multisensory approach</i> | 0/75 | 1/75 | 8/75 | 26/75 | 40/75 |
| <i>It aroused feelings of empathy and kindness, making me want to do better as an architect</i> | 2/75 | 1/75 | 12/75 | 21/75 | 39/75 |

| | Irrelevant.....Important | | | | |
|---|--------------------------|-------|-------|-------|-------|
| <i>It was a fun game; I would like to repeat it again</i> | 1 | 2.97 | 3 | 4 | 5 |
| | 13/75 | 16/75 | 20/75 | 12/75 | 14/75 |
| <i>It was shocking and a little bit scary</i> | 1 | 2.25 | 3 | 4 | 5 |
| | 32/75 | 14/75 | 14/75 | 8/75 | 7/75 |

Source: Own elaboration based on LOC/TUS surveys

Hence, as a general conclusion, participants qualify the experience of role-playing under a disability simulation as an enriching activity, acquiring a deeper comprehension of the diversity of users' needs, as well as realising what architectural barriers really signify for people with special needs. Far from being little insignificant details, students acknowledged their great consequences. Some of their remarks follow.

'Even though I knew the regulations, understood their logic, I never got to experience the city as a disabled person. It was way harder than I thought. Plus, I got to hear what the disabled thought about the same pathway I was walking on. I never thought that the tiniest detail makes a huge difference.'

'The testing for the daily situation of disabled people has helped me understand how difficult it is to move in the town. The slightest obstacle quickly becomes impassable. The architect has to change that.'

'I learned interesting details about blind people'

What is more, LOCUS IP succeeded in being an eye-opener:

'Using a wheelchair myself and not very successfully trying to manage slopes and other difficult barriers opened my eyes.'

'The simulation part was a real eye opener!'

'Meeting a blind architect and seeing the city blind was eye opening'

Participants were brought closer to the distant world of disabilities, breaking the current taboos on natural human intercourse, facing the reality of ageing and losing one's abilities. The goal is to defeat the common fear of the unknown and 'no way!' types of thinking. So often, in a disability simulation, there are people who are unwilling to sit in a wheelchair, or they refuse to move without using sight. Because of this, it is important to introduce the activity in a closer and friendly way, almost as a game, with a good sense of humour and jokes like, *'Don't worry, it's not contagious! You'll be able to stand up again.'* By bringing diversity (functional diversity, as it is commonly called in Spanish) into normality, people can be familiar with impairments.

In this respect, it is also important to remember the fact that part of the teaching staff and some students were people with disabilities themselves, either visually impaired or wheelchair users, which enhanced the 'normality' of the topic. This, in turn, is fundamental to escape from paternalistic attitudes and to enhance a real deep connection with the topic:

'It made me more aware of space barriers for disabled people. And it made me factor them in whenever I think about a project. Also, it made me reflect more on the subject in general. And I am very happy to have shifted my attitude from pity or empathy to normality!'

'I had, prior to that, not been in such a direct relationship with disabled people, so the workshop made me establish a personal connection to the challenges faced.'

'Participating in activities of the program makes you feel empathy for disabled people, and putting yourself in their situation does change the way you think.'

The importance of this approach lies in how assumptions and preconceptions about others are challenged and broken-down, as also described by Lifchez [1987] in his book, *Rethinking Architecture: Design*

Students and Physically Disabled People. Furthermore, when engaging students with disabilities as designers, who work in teams with the other able-bodied students in an intensive manner for fifteen days, as LOCUS IP greatly encouraged, a further understanding is attained. This process is also exemplified in the article ‘*Empathic design research: Disability + Relevant Design*’ [McDonagh et al., 2009].

Indeed, many other academics have pursued a similar approach for teaching accessibility, perhaps under different names, but with the same scope. For instance, Ringaert [2002: 274] explains ‘*Experience Based Learning*’ as one of her teaching methods, which is no other than organising “a session where students could experience the use of wheelchairs, crutches, canes, being blindfolded, having the hearing blocked, and having their hands restricted.” Ringaert goes on to clarify the fact that she has called this session “‘Experiencing the Inaccessible Environment’ to get away from the concept that they are experiencing a disability.” Why Ringaert feels it necessary to make this recognition could be a consequence of the negative connotations of the ‘disabled world’ described in the second chapter of this thesis, *STATE OF THE ART: Accessibility in current thinking*. Ringaert [2002: 275] concludes:

“Unfortunately I only have two hours for this exercise. I feel that this exercise should be longer, but I don’t have more time in the curriculum and I cannot keep the mobility devices for longer than a day as the School of Medical Rehabilitation needs them for their course work.”

Likewise, Harrison and Parker [2002: 343] also address the topic of teaching accessibility but from their Asian point of view. When explaining their *Methodology of Learning*, they provide a special section entitled precisely *Empathy and Simulation Exercises*, which is nothing more than carrying out disability simulations. The authors also wonder about the real benefits of such simulation exercises, noting that although “it is really necessary for the exercise to be sustained over a reasonably long period, (...) it is generally a memorable experience and (...) is likely to have more of a beneficial effect than cause real misunderstanding.”

Therefore, a possible counterargument against disability simulations is that it creates unrealistic awareness. For this reason it is relevant to insist on the importance of how a simulation of disabilities must be carried out: the experience has to be long and powerful enough so that the participants really grasp its meaning. In LOCUS workshops, students spent half day wandering around the historic centre under study while experiencing the different roles: as a wheelchair-user, as a crutches-user, as a blind person, as a partially sighted person, as a deaf person, or as an elderly person with a bit of everything. All roles were assigned randomly and in different spots of the city. Thus, students had the opportunity to feel in their own skin the real, unexpected and differing obstacles of the place. In contrast, it is not good enough if the students just sit in a wheelchair or walk around with their eyes closed for a few minutes, facing obstacles that they already know beforehand. This was the case in the LOTUS workshops, where the French coordinators had prepared a *parcours* with the most significant obstacles (ramp too steep, gravel terrain, opening doors, legroom space, etc.), which the group of students experienced in turns, meanwhile working on their designs.

The purpose of such a *parcours* (see Fig.31) is worth noting because the main common problems are included, even the ones more typical in indoor environments, which on the city tour might not be encountered. Nevertheless, the derived consequence of a planned route is that the experience is strictly reduced to that itinerary of obstacles, as if the only possible barriers were those and little else. Probably for this reason, one LOTUS participant stated:

‘I don’t think it was real enough. It was okay to give student a slight idea of what it’s like but the real, complex, everyday difficulties weren’t there. A stroll through other parts of the city would have been better than a “parcours” in a specific spot with made-up ramps.’

Figure 31: *Parcours* for disabilities simulations

Source: LOTUS-Sète [Own material]

In contraposition, when the students had the chance to experience a meaningful simulation during several hours wandering around the whole city centre, such as those carried out in the LOCUS workshops (see Fig.32), the remarks obtained were rather positive and encouraging:

'The circuit in a wheelchair was very important to me, because it is not the same when you see it as when you live it. It's an exercise that every architect should do for a whole day!'

Figure 32: Full day session of disability simulations in the city centre



Source: [Own material]

On the other hand, as also shown in the previous Tab. 3, participants also recognised the importance of a multisensory approach towards the built environment design, especially after experiencing visual and hearing simulations. This is particularly important because accessibility is usually linked to wheelchair users, and the sensory impairments are often left out of the discussion. This is why it is relevant to mention the following comments from the students.

'After LOTUS, I take care about accessibility in architecture for all kinds of disabled people, not just for the ones using wheelchairs.'

'I have learned a lot of facts about disabled people, even if I was already aware about some simple things linked to the uses, I think I learned more things about blind and deaf people and architecture.'

To be precise, the exercise of experiencing the space through the other senses when one is missing often entails discovering certain unexpected capacities, such as being able to navigate the space by using the haptic sense, or being able to locate one's position in the space through use of the olfactory and/or hearing senses. This is a revealing discovery for the students, as they themselves assert:

'(...) I knew the regulations for accessible architecture, but I never before got to experience it through my different senses. I found that very revealing and it got me to experience more with my projects.'

'I understood better that incorporating the senses in the fields of design and architecture can enlarge the experience of space.'

Furthermore, this methodology of "bringing design-excluded communities, such as older adults and people with disabilities", entitled by Myerson and Lee [2011: 36.4-36.5] *Designer as Researcher*, places a strong "emphasis on user participation and social engagement". That is, it pursues the "belief that the designer should be educated to act as an advocate on behalf of the user."

In this respect, it is important to note that the experience of 'kindness' is also explored within this method. Academic research on 'what makes people happy' demonstrates that being good to others produces more happiness than being centred only on oneself [Seligman, 2002]. That is why, for instance, there are so many blood donors willing to give blood to people that they won't ever meet, most likely. The British social researcher Richard Titmuss [1970] explains this question in *The Gift Relationship*, describing how donating blood is more effective when based on altruism than on economic values, treating the blood donor as another commodity. However, further studies claim that "blood donation is an act of benevolence rather than altruism" [Ferguson et al., 2008]. The relevance of this observation is that 'benevolence' is understood and based on both the donor's and recipient's benefit, while in 'altruism' hypothesis only the recipient gains. Similarly, Phillips and Taylor [2009] assert in their essay, *On kindness*, that feelings of generosity, reciprocity, and friendship are among the greatest delights.

Therefore, it is not only about charity to help those in need, but it is simply that we feel better when helping others, when having humanistic values rather than selfish attitudes. Hence, architects can feel extremely fulfilled when designing accessible environments and realising that the result is that people feel better, are happier. This is why a student had the urge to share:

'I want to be a good architect, who can help disabled people. I don't want to design only new, nice buildings, but also ones that are accessible.'

Thus, the reinforcement of humanistic and social values is achieved as well by such interactions with the 'disabled world'. Students acknowledged this fact with several remarks; such as the following:

'An experience like this makes you realize that good architecture means many things, not just iconic architecture or composition or materials. Good architecture serves people's needs, in every aspect.'

'Accessibility matters are something that should be taken into account when designing, the same way we do with structures or construction.'

'Thank you for everything again. It was fantastic to share this experience with international teachers and students who are working on this project, which is a mix of socio-logical/human values and design and architecture.'

What is more, such an experience drove students to deeper reasoning, making them wonder about the final aim and consequences of architecture.

'(...) a real eye opening experience. Not only to accessibility, but to the concept of really accepting all of us in the same public spaces, be it with a "cost" (aesthetic or financial) or not. You can't put a price on equality.'

'Meeting disabled professionals in the field of architecture and hearing their stories awakened my interest for universal design. It got me thinking about social responsibility and a bigger picture of what architecture is (should be) about.'

'(...) I think it was not until this workshop that I actually understood what it [universal design] could be, if all of us were equal in public spaces. What an encouraging goal.'

'Accessibility changed from being a code to meeting a personal goal for me to achieve.'

To sum up, the final goal of bringing the 'disabled world' closer to the field of design, by promoting the experience of having impairments and/or cohabiting with people with impairments themselves, is to enlarge the knowledge of diversity so that designing for all is more intuitively comprehended. The aim is to design in such way that everyone's expectations are equally met; in other words, it is about finding the user's satisfaction in the design. There are many terms used nowadays to describe such concerns, such as 'user-friendly', 'user-centred design' or 'experience-based design'. However, the term 'empathy-based design' is believed to be the more appropriate one in this case, since it relates to a more affective, emotional level of awareness, from which the values of improving the conditions of life through design spring. We cannot forget that accessible design will only be broadly accepted and therefore used by everybody if it is both functionally usable and aesthetically pleasant. Also, we must be aware that the design of spaces can affect our mood: those accessible designs with a regrettable clinical look, bringing an emotion of sickness and discomfort, and generating despair or sadness, interfere with human psychology to the point that "we may start to forget that we ever had ambitions or reasons to feel spirited and hopeful" [de Botton, 2006: 106].

Thus, human needs and values must be met with equally functional and aesthetic designs. In order to achieve that, it is fundamental to encourage students to explore human diversity, to embody and conceive multisensory architecture. What is more, it must be done in such a way that scholars feel engaged, understanding that it is not about 'architecture for the disabled' but architecture for all, i.e., inclusive architecture. For this reason, it is believed to be extremely fruitful to organise disability simulations, to share experiences with other 'functionally diverse' people, especially in a fun and normalised way and, more importantly, for a sufficient amount of time. In this manner, the students—architects of tomorrow—become researchers and users simultaneously, directly involving themselves in the activity. Thus, a change of values is produced and the aim of 'design for all' becomes their own goal and benefit.

4.3.3 On teaching accessibility

To conclude the evaluation of this case study, let us address the most significant results obtained in the LOC/TUS surveys:

Firstly, students were requested to provide information regarding their background and opinion of accessibility teaching. Nearly all of the respondents, with an average of 4.6 out of 5, stated that accessibility teaching should be included in the architecture degree curriculum; although only around 42% of them affirmed that they had had some kind of accessibility teaching previous to LOC/TUS experience. Among this 42% (32/75 participants), only about half of them had it as a mandatory course. That is, only 17 out of 75 participants, which equals approximately 22.5% of the total, confirmed that they had had accessibility teaching as a compulsory curriculum course during their architecture studies. Concerning this data in relation to each participating architecture school, see following Tab.4:

Table 4: Statistics on accessibility teaching

| PARTICIPANTS CONFIRMING TO HAVE HAD ACCESSIBILITY TEACHING AS A MANDATORY COURSE | | |
|--|--|-----------------|
| Participating schools (ordered alphabetically) | Nº of students (out of the nº of respondents) | Study year |
| ENSAM (La Réunion, France) | 0 (out of 5) | - |
| ENSAM (Montpellier, France) | 2 (out of 11) | 3rd (1 person) |
| | | 4th (1 person) |
| ETSAV (Sant Cugat del Vallès, Spain) | 1 (out of 18) | 4th |
| FAUTL (Lisbon, Portugal) | 0 (out of 5) | - |
| JADE-HS (Oldenburg, Germany) | 0 (out of 5) | - |
| LTH (Lund, Sweden) | 1 (out of 2) | 1st |
| PK (Cracow, Poland) | 4 (out of 7) | 1st (3 persons) |
| | | 3rd (1 person) |
| TUT (Tampere, Finland) | 7 (out of 7) | 3rd |
| UAUIM (Bucharest, Romania) | 0 (out of 4) | - |
| UNIRC (Reggio Calabria, Italy) | 2 (out of 11) | 1st (1 person) |
| | | 3rd (1 person) |
| URV (Reus, Spain) | 0 (out of 0) | - |
| TOTAL | 17 (out of 75) | |

Source: Own elaboration based on LOC/TUS surveys

The results indicate a general lack of accessibility teaching in almost all the schools surveyed. Among the schools obtaining a positive result on the question, the only reliably consistent results seem to be TUT - Tampere University of Technology. Nevertheless, several Finnish students have indicated they are content with the LOCUS methodology of innovative teaching rather than the customary methods of their home country. Some of their remarks are worth quoting:

'I can emphasize more. I appreciate a lot that the LOCUS approach was not at all preaching, which is too often the case in Finnish education. Because in the end, preaching backfires.'

This comment was provided by one Finn in response to the question about how and why their participation in LOC/TUS changed their perception towards disabled people. Hence, the atmosphere of 'normality' planned as a *sine qua non* condition was positively appreciated with satisfactory results. Moreover, when asked how and why their participation in LOC/TUS changed their perception towards architecture and universal design, another Finn stated:

'Experience [of participating in LOC/TUS] gave understanding that it [universal design/accessibility] is not a separate part of the design task. In my country we are too strict with regulations and, because of that, we use standard solutions too many times, which leads to separate routes for the disabled and other people, and non-optimal experiences for all users.'

This observation is crucial to note, because it reveals and addresses fundamental realities that this dissertation denounces: the lack of equality in accessible designs; boredom and repetitiveness among architects; and the segregation and discrimination toward the disabled that all these generate. In short: it corroborates the existence and failure of the 'design for the disabled'.

Regarding the general evaluation of the programme, students rated 4.11 out of 5 the general academic/learning outcomes, while the average score when estimating personal outcomes was 4.45 out of 5. Students were also asked to grade several aspects concerning the level of relevance in relation

to the IP, and the resulting ranking is provided in Tab.5. Again, in the following table, the different concepts are ordered according to the resulting average ranking, together with an additional second row showing the real number of students grading each question for a deeper understanding. This second row in grey letters shows the real number of replies out of the 75 respondents, while the most valued for each level of importance/agreement (1= irrelevant/strongly disagree vs. 5= very important/strongly agree) are highlighted in bold letters in order to validate a maximum coherence in the results analysis.

Table 5: Enquiries on IP attributes

| | Irrelevant.....Important | | | | |
|--|--------------------------|-------------|-------|-------------|-------|
| ACCESSIBILITY TEACHING APPROACH: bringing the 'disabled world' closer by organizing disability simulations and lectures from disabled experts | 1 | 2 | 3 | 4.65 | 5 |
| | 0/75 | 0/75 | 3/75 | 20/75 | 52/75 |
| INTERNATIONAL WORKGROUPS: opportunity to learn from partners from different countries in a cooperative way | 1 | 2 | 3 | 4.55 | 5 |
| | 0/75 | 1/75 | 7/75 | 17/75 | 50/75 |
| THEME 'HERITAGE & ACCESSIBILITY': opportunity to study a topic that I cannot easily find in my home University | 1 | 2 | 3 | 4.43 | 5 |
| | 0/75 | 4/75 | 4/75 | 23/75 | 44/75 |
| TRAVELLING: visiting places and making new friends | 1 | 2 | 3 | 4.24 | 5 |
| | 1/75 | 1/75 | 16/75 | 18/75 | 39/75 |
| INTENSIVE CHARACTER: allows project immersion, empathy with the site and the inhabitants' problems | 1 | 2 | 3 | 4.21 | 5 |
| | 1/75 | 1/75 | 9/75 | 34/75 | 30/75 |
| ERASMUS PROGRAMME: contact with different universities | 1 | 2 | 3 | 4.07 | 5 |
| | 2/75 | 2/75 | 14/75 | 28/75 | 29/75 |
| ACADEMIC LOAD: 4 ECTS credits | 1 | 2.53 | 3 | 4 | 5 |
| | 23/75 | 13/75 | 21/75 | 12/75 | 6/75 |

Source: Own elaboration based on LOC/TUS surveys

Therefore, as a conclusion of the previous table, the 'Accessibility teaching approach' was clearly the aspect most valued, but not far away from the following ones, while the 'Academic load' was the least valued with an evident difference in score. The reason for this disagreement with the activity's academic load should be further researched, since the survey did not ask specifically why. It could be a disagreement with the amount of credits conferred to the activity, or it could be simply that, compared with the other concepts evaluated, these were considered more significant and essential. Concerning the rest of the aspects evaluated, their respective average scores obtained are not far apart. Finally, let's pay attention to the incongruous result regarding the 'Intensive character'. Note that it corresponds to the 5th position (row) in terms of the general ranking. However, when we look at the total number of people who gave it a rating 4, it would actually correspond to the 2nd position. This characteristic, which is not undoubtedly qualified as relevant by LOC/TUS participants, is indeed believed to be an essential trait for a successful empathic understanding of accessibility, as will be argued next:

The intensive character of LOC/TUS IP allows the creation of a working environment with a complete immersion into the subject: the participants do not only inhabit and work in the target city for fifteen intensive days, but they do so from the particular point of view of people with special needs. This particularity allows, in a natural way, an existential approach towards the topic; it facilitates the process of "designing from the inside to the outside", as defended in the book *Architecture Inside Out*: the starting point of any design process should start "from the potential of the site and the needs of local residents" [Franck and Lepori 2007: 43]. LOCUS sites were inhabited day and night so that its life could be felt and experienced, the locations of desirable places could be known along with why they feel desirable, as well as the vacant locations and why it is they were empty. This translated into proposed innovative designs that improve the general accessibility and liveability of the place.

What is more, the comprehension of inclusive design was cultivated by providing embodied experiences to the participants through impairment simulations, and by offering specific lectures given by disabled experts. Cohabiting and working on a topic for a few days confers the opportunity for students to interrogate and obtain meaningful explanations, because important questions rarely arise immediately, but they usually arrive with some delay due to needed reflection time. In addition, students had to make special effort to make their proposals comprehensible to Mourão, the blind architect who joined some of the workshops. Thus, it was not enough to just explain the project by describing it, but they also developed alternative systems of representation such as relief plans and maps, tactile models, special signs, etc., which also became a relevant part of the learning.

In fact, students were asked both their perception towards disabilities prior to and after participating in LOC/TUS IP and, while 70.5% (53 out 75) of the students stated that they had a vague and distant knowledge about PwD before the activity, 74.5% (56 out 75) asserted that their perception towards PwD changed after LOC/TUS IP. Most of the feedback received on the latter question was comments acknowledging the benefits of disability simulations as well of meeting and cohabiting with other disabled students and/or teachers, as described at length in 4.3.2 *On normalizing diversity*. Likewise, students were also asked about their perception towards accessibility in architecture, and 76% (57 out of 75) claimed that it had changed after the activity. According to the feedback obtained, it shifted towards a major understanding of the significance of architectural barriers and the importance of multisensory architecture. Many other comments expressed greater values placed on social responsibility.

However, further questions enquiring about the comprehension of accessibility and inclusive architecture were addressed to the students, and the results obtained are pretty much the ones expected, although some incongruences and/or unexpected understanding have been detected as well. It is important to point out that, in this case, students were asked not to value each statement according to their level of agreement/disagreement, but to put in order the different options given. That is, students assigned the ranking of importance to different aspects concerning inclusive architecture and accessibility, respectively, which made them prioritise some aspects over others instead of conferring the same importance to several aspects. The following Tab.6 displays the results.

Table 6: Enquiries on inclusive architecture and accessibility

| PARTICIPANTS CONFIRMING TO HAVE HAD ACCESSIBILITY TEACHING AS A MANDATORY COURSE | | |
|--|---|-----------------------------|
| | | Average score (out of 5) |
| Inclusive architecture | Barrier-free architecture | 4.79 |
| | Sustainable architecture | 4.20 |
| | Multisensory architecture | 4.01 |
| | Architecture for the disabled | 3.64 |
| | Empathic architecture | 3.15 |
| | Iconic architecture | 1.57 |
| Accessibility | Accessibility is a universal right, essential for guaranteeing the same opportunities | 5.19 |
| | Accessibility and suppression of architectural barriers are necessary to achieve complete normalization | 4.22 |
| | Guaranteed accessibility is important for solidarity and compassion towards those who need it the most | 3.58 |
| | Accessibility should be guaranteed, either from the front or door. | 3.07 |
| | Guaranteed accessibility is necessary for fulfilling regulations | 2.73 |
| | Accessibility is a new field for professional opportunities | 2.46 |

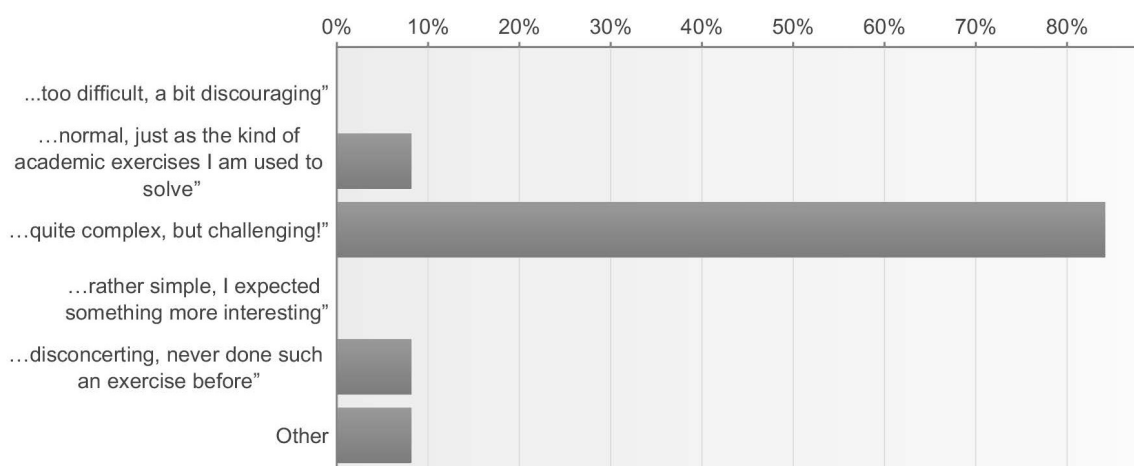
Source: Own elaboration based on LOC/TUS surveys

Following up on the previous table, students understand inclusive architecture to be without architectural barriers and also that which provides a multisensory experience, which was expected. Such

architecture contributes to sustainability, since it takes into account human beings at all stages of life. Thus, that means that future rectifications won't be so necessary and/or such a problem when meeting the needs arising from expected declines in abilities. However, it was also expected that students would understand inclusive architecture to be an empathic design rather than a design for the disabled, for the same reasons as before: an inclusive architecture is aimed at all human beings at all stages of life. Thus, it is more about imagining oneself in the different phases of life, rather than just thinking about PwD. Concerning their understanding of accessibility, students consider it necessary to promote equality and normalisation, as expected. However, on the other hand, accessibility for reasons of solidarity and compassion scored higher than accessibility as a professional field, thus implying an understanding closer to designing for the disabled rather than something necessary and beneficial to everybody.

Learning not only about the understanding acquired after the activity but also about the complexity of the academic exercise proposed was also aimed at by the LOC/TUS survey. Thus, students were asked to choose among the different given options to complete the following sentence: *'Balancing accessibility in topographically complex cities with protected heritage was...'* and the result undoubtedly was *'...quite complex, but challenging!'* The statistics of the answers obtained are displayed in Fig.33 below, followed by some of the student's remarks on the question.

Figure 33: Answers to *'Balancing accessibility in topographically complex cities with protected heritage was...'*



Source: Webropol statistic results based on LOC/TUS surveys

'Challenging, exciting, nerve-wracking and fun, all at the same time. Never done such an exercise before'

'An interesting and motivating challenge'

'Interesting and very educational. I liked it a lot'

'An experience that changed my whole point of view about designing our surrounding world, and this combined with making good friends'

Designing equally accessible environments for all requires more attention, precision and skills, especially in complicated existing built environments where the manoeuvre of action is more restricted. Students acknowledged this fact, following some of their remarks:

'(...) My perception after the Workshop is that we need to reinforce the synergies between the "Old" and our contemporary needs, introducing the accessibility into the project in the most natural way, and this is only possible with a fearless (but respectful) approach to the Heritage.'

'I had never thought about the relation between heritage architecture and accessibility before. It's like we delete the problem from our mind because we don't experience that problem. After LOCUS I started to see that problem from another point of view and to consider it in all my projects, be they modern architecture or restoration of the old.'

'(...) it made me understand that making heritage accessible doesn't mean destroying its value. What's important is that the interventions are well designed and studied!'

What is more, a friendly, closer and empathic approach, such as cohabiting with PwDs and the disability simulations in LOC/TUS, is basic to establishing a deeper connection with the topic and understanding the aim of suppressing architectural barriers for the common good. That is, improving accessibility becomes to some extent a personal objective as well as a motivating challenge, as the following diagram in Fig.34 describes.

Figure 34: Schematic diagram of the disability simulation effects on architecture students



Source: Own elaboration

To conclude, it is relevant to reflect on the condition of LOCUS IP as an Erasmus activity: LOCUS IP was originally conceived as a means to incorporate 'design for all' into education, which many architecture schools lack in their curricula. Too often, school study plans are very rigid and strict, and there is little room for new topics and necessary renewed approaches, such as today's unavoidable questions of inclusive design. By opting for an Erasmus format, as LOCUS IP does, schools are free to introduce innovative proposals into their teaching methodology. Further, it confers the opportunity for various nationalities to work together and provide their own, different views and input to the topic of universal design. The added value this entails is self-evident; the international environment has turned out to be an eye-opener, where participants have developed deep and empathic relationships:

'What motivated me the most was the chance to work with a multicultural team for a change, with students who had different approaches and worked with different computer programs, for instance, and who had a different method regarding the same problem (disability). It turned out to be everything I had expected and more. In those two weeks the amount of information you absorb is stupendous. I recommend this experience to any architecture student!'

'Working with persons of different countries with different cultures, different ways of thinking, of conceiving and the different lectures changed my perception.'

'It was a wonderful experience, where we got to learn so much from so many different people with different backgrounds and from different countries. It was very intense and fun. Loved the people, loved the place, loved what we were doing all the way.'

Thus, the possibility offered by the Erasmus format of cohabiting, sharing and working together for a common purpose, together with counting on the direct participation of disabled persons themselves, allowed the development of successful empathic connections among the participants, which burst into genuine learning. As Schwartz [2002: 338] says, there is "a distinction between knowing something versus knowing how to do something".

On the other hand, the weakness of the Erasmus format is that only a few students can participate, and that it can only be held once a year during a maximum of three consecutive years. This means that barely five selected pupils from each school per year can take advantage of such an initiative, but not a full class, as would be the ideal. This fact did not go unnoticed by some participants, one even demanding: *'Increase the number of participants!!!!'* In any case, the experience is qualified as a success; the level of satisfaction was, in general terms, outstanding. However, it is necessary to note that the students who voluntarily replied to the questionnaire were those most motivated and pleased with the activity. Hence, the majority of comments were positive and showed gratitude, such as the following one:

'It was a lifetime experience! Very interesting concerning architecture for all, as well as meeting amazing people (teachers and the other students). Please keep doing it be-cause it was just AMAZING!'

Not only the students, but also all the participating professors have shown commitment in their respective schools enthusiastically, such that after LOCUS (2008-2010, coordinated from UPC, Spain) and LOTUS (2011-2013, coordinated from ENSAM, France), the Finnish and Italian partners have decided to take the baton for the next three years with a renewed proposal for the programme. The idea is that every three years one of the partner institutions will assume leadership, or even two partners simultaneously –as is the case currently– which facilitates an increase in the number of participating countries interested in taking part in these 'design for all' topic workshops. In this manner, the network of European Universities teaching inclusive design is perpetuated and expanded. In this sense, I believe that the primordial aim of cultivating interest in inclusiveness for design is already set into motion, and that it will continue to disseminate across borders and into institutions until it has become fully integrated within the curricula of every architecture school.

5

Final discussion:
The essentials and limitations of
accessible design

Let us start the final discussion of this dissertation which addresses the essential ideas of accessible design, while exploring as well the limitations of its implementation.

The discussion seeks to explore the hidden connotations that the built environment can arouse, while reflecting about not only the functionality of accessible built environments, but also other important factors, such as the design's aesthetic and affordable quality, since they can determine the full acceptance and success of accessibility. There are several questions to bear in mind: What is wrong with current accessible architecture? Why is it rejected by default by 'able-bodied' people and only used by disabled people who have no other option? Is it also related to economic reasons?

The discourse brings together general theoretical reflections on the theory of architecture, with specific concerns of the study of accessibility. As far as possible, the different ideas presented along the speech are illustrated with practical examples for a greater understanding. Occasionally, the discussion is reinforced with comments extracted from the questionnaires conducted among People with Reduced Mobility (PRM hereafter), the full detail of which can be consulted in the *Annex B. PRM surveys*. The discussion is structured in three main sections:

- **Essentials:** Firstly, the basic concepts for an accessible design will be presented, but specially concentrating on those parameters that are often left out of the regulations and that are intrinsically important: usability, flexibility, personalization, hapticity, multisensory design, etc.
- **Emotional wellbeing:** Secondly, special attention will be paid to the egalitarian, or not, nature of accessible solutions and the consequences thereof. That is, the emotional wellbeing that accessible solutions can entail to its users will be also explored since it becomes a key factor for its full acceptance. What is more, the lack of equal quality of accessible solutions conditions social awareness towards PwD, and even own self-awareness of PwD. For instance, if accessible designs that require the help of third persons (e.g., a ramp too steep, a secondary accessible entrance without a bell, etc.) are given, it is not surprising that people tend to think that disabled people need help most of the time (or all the time). What is more, PwD tend to feel always different from the rest, with separate entrances, separated bathrooms, a separated spot in the theatre, and a long list of et ceteras. Such effects on the person caused by the built environment design are worth considering.
- **Limits:** Finally, questioning if there are, and if so, what are, the limits of implementing accessible design will be also addressed. We could easily conclude that the main limitation

is related to economic reasons, but is it really so? Aren't there any studies or cases where forecasting and making things accessible a priori have become a money saver? Aside from this, is it necessary to establish different degrees of accessibility to better suit the existing built environment? It becomes more realistic or discriminatory on the contrary?

All these questions will be discussed next:

5.1 Essentials

5.1.1 Usefulness

Usefulness is a fundamental characteristic of all design, especially when addressing inclusive design for all people. Usefulness, indeed, has always been a critical factor in design, especially after World War I, with the modernism movement and its principle “form follows function”.

However, modernistic thinking often paid more attention to ‘form’ than ‘function’, understanding the human being either in an idealistic manner or as an ‘average-man’, while rejecting the individuality of people. That is, it was not very functional and inclusive at all. By the late 1960s, the problems with modernism in architecture became evident, and professionals “began advancing the idea that design could be human-centered and truly dedicated to usefulness. This refocus on usefulness was motivated by a deep sense of social responsibility.” [Steinfeld and Maisel, 2012: loc.1093] Indeed, this new comprehension coincided in time with the social goals defended by disability rights movements, when accessibility thinking was set into motion, paying special attention to removing physical obstacles and making built environments easier to use for PwD.

Nowadays, the fusion of human-centred ideals with the social duty awakened in the civil rights movements are now converging to frame inclusiveness thinking; i.e., the idea of not only improving functionality, but also of offering equal rights to all people to participate and enjoy all stages of society with equitable quality. Nevertheless, we still have to spread and strengthen the idea that accessibility is much broader than disability issues; in other words, and using the American terminology, although UD was formulated “to the greatest extent possible”, unfortunately it is primarily related to PwD and little more for the common people.

In order to change this conception, we must pay special attention to the aesthetic-emotional dimension of design, as it will be further explained in next sections, so that all people feel engaged and willing to use the accessible product or built environment. What is more, designs must respond to human performance, taking into account the needs of all people equally, that is, without giving priority to the needs of small minorities if that means that the majority has to sacrifice their comfort. The idea is to find all those characteristics that, besides being essential for some PwD, are equally beneficial to all individuals.

There are many simple examples of considering the essentials for PwD, without ignoring the needs of the majority, such as providing nonslip surfaces and grips, arranging resting areas or seating surfaces along paths to recover strength, or allowing the use of spaces and products with a neutral body position. All these requirements can be fundamental to some people, and are equally beneficial to everyone.

What is important for a good usability is to recreate in one's mind the most likely movements and actions of the users in a given scenario, so that the variety of needs and situations can be forecasted.

For instance, in an airport people are more likely to carry heavy packages, so everyone would benefit from having shelves or free surfaces at a neutral height instead of having to leave the load on the floor and picking them up afterwards. In contrast, these shelves become very necessary for people with knees or back problems, or people with spinal cord injuries who have no abdominal muscle strength and who might need to exert themselves excessively for anything other than a neutral body position. As an example, the problem of not having shelves available when using the bathroom is clearly illustrated in Fig.35 below. As the reader can see, luckily, at least there was enough space to leave the luggage on the toilet itself:

Figure 35: Accessible toilet in CDG Airport



Source: Paris, France. [Own material]

Nevertheless, we must admit that it is not always possible to find a design solution that fits everyone's needs equally. In such situations, multiple options or adjustable solutions in height or width, that is products offering the option of personalisation, are good answers for an inclusive design. In short, as described in the *Universal Design India Principles* [Mullick et al., 2011: online], "universal design requires incorporating flexibility, adaptability and modularity to achieve best fit and mass customization for everyone."

Different examples of flexible and adaptable designs can be found in the offices of the Finnish association of disabled people named *Invalidiliitto*, in Helsinki. For instance, in furnishing the cafeteria, chairs and tables with different heights were provided, as pictured in Fig.36 below. Apparently, all the furniture looks the same, thus nobody feels labelled or discriminated to a certain area, but taking a closer look at the left picture below, one can notice how the table on the left is higher than the table on the right. Similarly, in the picture on the right, the chair in the middle is lower than the other chairs next to it. Flexibility in use is provided here by offering a variety of choices, thus the users of the cafeteria simply choose whatever option works best for them.

Figure 36: *Invalidiliitto* building: cafeteria area



Source: Helsinki, Finland. [Own material]

Likewise, different sizes of chairs are found in the waiting area (see left upper picture of Fig. 37 below) and possibility of choice is also offered in the coat rack and wardrobe (see pictures on the right of Fig. 37 below), which are designed in such a way that hangers are located at different heights so that both tall and short or seated people can use them. One could say that providing only one low coat rack should be enough, since tall people can reach it, while in contrast short or seated people could not reach it if it were higher. The problem then would be tall people hanging long coats, which would end up touching the floor and probably getting dirty. Thus, providing variety of choice is a fine way to ensure accessibility and usability, but it is not the only one. Another feasible solution is adjustable furniture allowing personalization in use, like the chair and office desk pictured on the bottom left in Fig.37 below, whose height can be adjusted anytime according to the needs of the person using it.

Figure 37: *Invalidiliitto* building: (left) coat rack; (middle) wardrobe; (right) office desk and chair with adjustable height



Source: Helsinki, Finland. [Own material]

Nevertheless, it is true that some needs of particular groups act as opposites to other requirements demanded by other communities. This is frequent if comparing the wishes between blind people and wheelchair users. For instance, for visually impaired people, kerbs are extremely useful because they serve to easily distinguish the sidewalk from the road, while for wheelchair users kerbs are impassable, thus necessitating kerb ramps. In this respect, the pedestrian crossing solution implemented in Stockholm is worth addressing: as illustrated in Fig.38 below, the pedestrian crossing is divided into two parts (not equally divided), being approximately one third destined for people on wheels in the form of a ramp and the other two thirds in the form of a step, which is paved differently from its surroundings as an identifiable limit between the sidewalk and the road. The traffic light, or the crossing signpost is placed at the border between the kerb ramp and the tactile kerb by default, so that the step generated in their encounter becomes no danger for the pedestrians.

Figure 38: Pedestrian crossing in Stockholm



Source: Stockholm, Sweden. [Own material]

Why the pedestrian crossing is not equally divided in length, or even questioning if the opposite design would work better, are questions worth addressing. One feasible argument would be that the larger area is reserved for visually impaired people since they cannot be as precise as people with sight to reach their target, while people in need of the ramp presumably have good vision and can direct themselves to the narrow area where the kerb ramp is. Nevertheless, a counterargument could be that blind people use tactile pavement as guidelines to move around the city, and thus: Wouldn't it be more effective to build a path of rough-surfaced tiles leading from the building facade to the pedestrian crossing? In this way, the length of the pedestrian crossing with a step would be reduced to the minimum necessary, while the rest would remain barrier-free for the rest of the population.

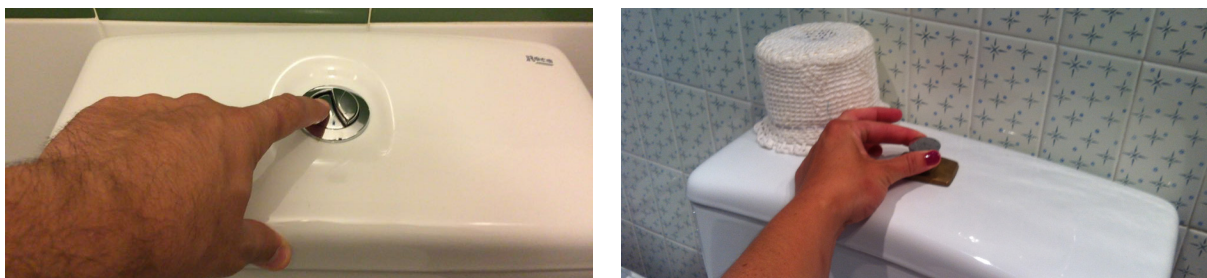
Indeed, as the reader can notice in the right picture above, the pedestrian crossing is quite busy, and people on wheels do not necessarily place themselves on the kerb ramp side, since it is notably narrow. Although the kerb step has been lowered from 12 to 3cm so it can be surpassed on wheels with minimum effort, it can still cause stumbles and/or falls, since it is easier to overlook it due to its low height. Regardless, the Stockholm model of pedestrian crossing seems to be widely accepted by Swedish society. It was designed in collaboration with PwD institutions and has been in implementation since the 90s [City of Stockholm, 2010: 49-50]. Therefore, Stockholm's pedestrian crossing becomes a good example of a co-design result, where the different needs of people coexist fairly successfully.

To conclude, another concept to bear in mind for a good accessibility and usefulness is that all elements susceptible to be manipulated or supportive to human hands, such as handles or banisters, should be sized and shaped so that the hand fits perfectly, i.e., with ergonomic forms and avoiding sharp edges. Such shapes are perceived as more inviting and comfortable, thus they are more frequently and easily used. Indeed, accessibility is also about designing products that provide a feeling of wellbeing, are easy to handle and are attractively shaped. In the words of the German academic Loeschcke [2011b: 141], who holds the only German chair for 'accessible building' at Karlsruhe University:

"The dimensioning should correspond to the size of the hand, the design and use of shape suitable for access from different positions as well as having a pleasant touch (haptic), materiality and surface property. United in a convincing way, it provides intuitive hold, support during all handling, and therefore physical as well as mental security."

Thus, accessibility is also a matter of providing a sense of safety, and it is also important for providing a gratifying haptic experience, since "this pleasant product experience is necessary, in order to convince people and to live with a product for a long time" [Haug and Schönherr, 2011: 25]. Gently curved shapes, warm materials and pleasant to touch surfaces are important parameters to bear in mind when designing efficient functional tools and aids. In addition, handles should allow use for those with no fingers (or bad mobility; e.g., osteoarthritis), or no arm (using the elbow instead). Likewise, all mechanisms and devices for control, such as switches, toilet flushers, water taps, etc., should be designed so that they can be operated by pressing or pushing, instead of turning or pulling. Fig.39 below shows a good (left image) and bad (right image) design example of toilet flushers:

Figure 39: Toilet flush: (left) good design by pushing: (right) bad design by pulling



Source: [Own material]

What is more, all mechanisms for control should be placed in a contrasting way from its surroundings so that everyone can easily find them. Following Steinfeld and Maisel's [2012: loc.3641] suggestion: "Controls, such as light switches and dimmers, public address volume controls, and thermostats, can be organized as control panels, as in a vehicle." Similarly, utility spaces such as public toilets, coat check rooms, vertical communications, etc., "can be grouped together as a block designed to contrast with the surrounding spaces. They can even have a distinctive colour and shape that contrasts to the surrounding architecture." In this way, everyone, including people with sensory impairments, can easily detect them and even serve as wayfinding landmarks. Reasoning that leads us to the next section:

5.1.2 Multisensory experience

The multisensory perception of the built environment has already been addressed for several years by many academics, who discuss its great significance for a richer and holistic experience [Bachelard, 1957 and 1960; Blesser and Salter, 2006; Bloomer et al., 1977; Pallasmaa, 2013; Prochnik, 2010; Rasmussen, 1964].

We all depend on a rich multisensory environment for a greater experience of architecture; "qualities of space, matter and scale are measure by the eye, ear, nose, skin, tongue, skeleton and muscle (...) architecture involves several realms of sensory experience which interact and fuse into each other." [Pallasmaa, 2013: 45] Thus, a multisensory conception of the built environment is necessary for high architectural quality, but more significantly, it is essential for inclusiveness, since it is crucial for people with sensory impairments. It is well known that people lacking one sense rely on the other senses to compensate; e.g., blind people rely heavily on their haptic perception ("sensory information derived from both skin sensors and active limb movements." [Steinfeld and Maisel, 2012: loc.3130]), as well as the sense of hearing, smell and taste. Likewise, deaf people rely primarily on their sense of sight, as well as their haptic system and other senses.

"The polyphony of the senses", concept coined by the French philosopher Gaston Bachelard [1960: 6], can be useful for comprehending how people with sensory impairments perceive the built environment. Bachelard explains how all the senses collaborate together in constant interaction for a full bodily experience of our surroundings, for one's sense of reality. The term 'polyphony' evokes the realm of music, so let us picture an orchestra playing: if one instrument/sense is lacking, the others will play more powerfully and there will be still music/perception. In the same manner that we can still listen to the melody with fewer instruments in the orchestra, sensory impaired people are still able to perceive their surroundings, only with fewer senses.

This is why it is absolutely fundamental to always provide important information under the "principle of two senses", that is, facilitating the message through at least two, or more, senses: visual, audible, tactile, and/or olfactory information. Although several writers have written about this need, perhaps using different names to describe it, this principle is not so commonly known. It can be found, specifically under the term "principle of two senses", in the recently published *International Standard ISO/FDIS 21542:2011* already introduced in chapter 2. However, as already stated, ISO standards are voluntary and only available through payment. Thus, it is comprehensible that its diffusion is not so extended. The exact ISO description of the "principle of two senses" is provided next [ISO, 2011: 99]:

"Article 39.2. Principle of two senses: Supportive measures for information and wayfinding shall be provided in a format that is accessible to people with sensory impairments according to the principle of two senses:

- audible/tactile information for people with vision impairments, and
- visual information for people with hearing impairments.”

Other academics have described this same idea under different names. For instance, already in 1973, when Pastalan, Mautz, and Merrill [1973: 388] studied the environmental barriers concentrated in age-related sensory loss, they described the need of providing “redundant cueing”, which “means beaming the same message through more than one sensory modality.” Likewise, all of the lists of principles for UD, ID or DfA (described in detail in the *Annex A* of this dissertation) include one principle that refers to this idea of using at least two senses, to some extent:

- ***Perceptible information***; *use different modes (pictorial, verbal, tactile) for redundant presentation of essential information* (4th Principle of Universal Design [Connell *et al.*, 1997: online])
- ***Legibility***; *a place that is easy to navigate* (5th Principle of Good Design [CABE, online])
- ***Understandable***; *everyone knows where they are and can locate their destination* (8th Principle of Inclusive Design [RIBA, 2009: 6-7])
- ***Comprehensible***; *a) Clear information and b) Spatial distribution* (5th Principle of Design for All [EuCAN, 2008: 14])
- ***Usable (Sahaj)***; *Offer multisensory feedback to point in the right direction* (2nd Principle of Universal Design India [Khare *et al.*, 2011: 7-8])

Therefore, this guideline not only applies to general information provided –e.g., “stroboscopic visual signals can be provided to augment audible fire alarms for people who are deaf or hard of hearing” [Steinfeld and Maisel, 2012: loc.3300]– but also to the actual design of spaces.

Unfortunately, it often seems that contemporary architecture has lost the meaning of the ‘where’, since similar constructions can be found in different locations of the globe, with divergent climatic conditions. As a consequence, many of our surroundings look extremely alike, with the uniformity and loss of individuality that this entails. The Swiss scholar Roderick Lawrence [2001: 148] describes how, due to this monotonous uniformity, people can feel detached from their external surroundings, to the point of not being able to identify reference points and navigate the space:

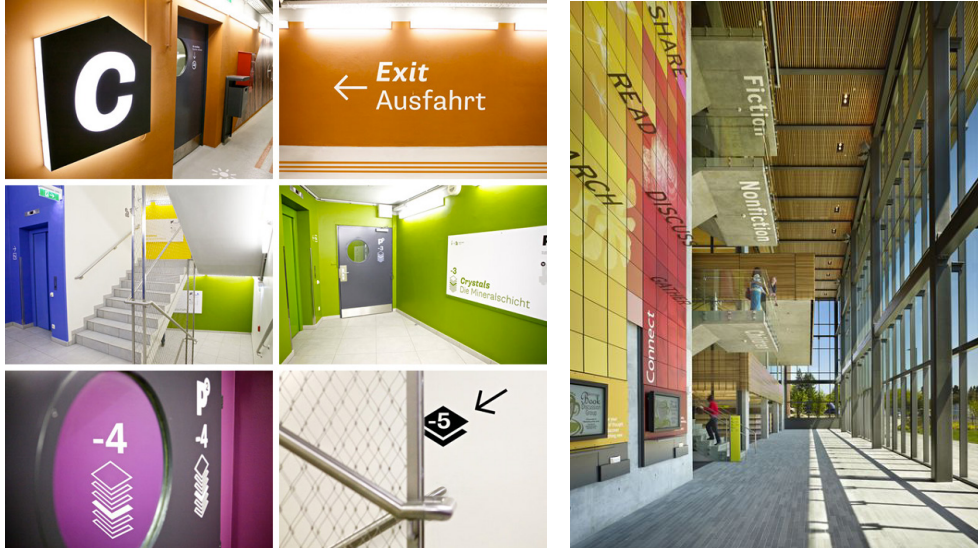
“When people lose their bearings in modern airports or administrative buildings despite signposting it is largely because they cannot rely on their five senses to reorientate themselves in a sterile interior. The restricted sensory dimensions of modern buildings mean that people can feel detached from or hostile towards their daily surroundings.”

Lawrence also calls for a more multisensory approach to combat this problem. He goes on to criticise the current Western emphasis on vision, especially because our wellbeing is a dynamic phenomenon that indirectly depends on questions of architectural composition, proportion and order, as well as identity and distinctive character. The appropriate combination of these tools will lead people to identify whether an environment is supportive or harmful.

The idea is to ease perception and enhance clarity by separating the ‘target’ from its background. To do this, colour, shape and texture can be called into play. Indeed, signage in buildings for better indoor navigation has become a central issue in recent times, finding excellent and imaginative examples of signage for architectural wayfinding integrated into the built environment, such as the following

images in Fig.40 illustrate. Designers combine the use of colours, light, numbers and icons to provide an intuitively comprehensible building directory and indoor navigation. These strategies have long been used in parking management, to help drivers find their vehicles, and they are every time used more in general public building circulations as well.

Figure 40: Examples of signage for better architectural indoor wayfinding



Source: (left) Business Park Vienna's P2 car park [Typejockeys and Nana Architektur: Online]; (right) Vancouver Community Library [Miller Hull Partnership: Online]

We must be aware that “80 percent of the sensory information the brain receives comes from our eyes” [NIH, 2008:12], so we must acknowledge the fact that providing information by means of two or more senses is most essential for people with visual impairments; in this case, through sound, touch, and smell. Nevertheless, it is still notably significant for sighted people. To provide some examples: a change of texture in the pavement such as a parquet floor in a resting area vs. a ceramic flooring in a working space, can be used by people with sensory impairments to identify the space's character change and act accordingly. Likewise, in a room with carpeted walls, the sound is muffled thus the tendency is to be quiet and enjoy the silent environment. The temperature received by this material is much warmer if compared to a glass surface for instance; hence the warmth perceived by our haptic system is also providing us information.

Therefore, many subtle appreciations such as the ones described (change of pavements, materials, surfaces, etc.) can go unnoticed by people with sight, because the eye provides strong information to our mind that counteracts the others; but these others still remain essential at a generally subconscious level, and more importantly at a conscious level for those with sensory impairments. At the moment of truth, the feeling of satisfaction, satiety and comfort is transmitted by the other senses rather than sight: taste/stomach to feel full, touch to feel embraced, soft whispering to feel cared for, etc. Paraphrasing Pallasmaa's words, while the eyes stroke distant surfaces, contours and edges, it is the unconscious sensation (tactile, auditory, taste) which determines whether an experience is agreeable or unpleasant. [2013: 46]

Furthermore, aside from the different reactions and associations that the used materials can evoke with their diversity of shapes, textures and resonances, these can also condition movement. Bloomer and Moore [1977: 71] describe how movement is influenced by our haptic sense in the built environment:

“The fit and movements of our bodies within and around buildings are also significantly affected by our haptic sense, by the tactile qualities of the surfaces and edges we encounter. Smooth surfaces invite close contact, while rough

materials such as hammered concrete generate movement in wide radii around corners and more careful, tentative movement through corridors. Changes of texture often signal special events and can trigger a slowing or quickening of one's pace. **It would be possible to generate a whole choreography of movement through the composition of textural changes alone.**"

Therefore, as Franck and Lepori [2007: 56] state: "Architecture does not simply suggest movement; it frequently choreographs it, encouraging us to move in particular ways, adopting particular positions, sometimes quite insistently." A good example is the one given by the authors when explaining how the design of stairways conditions our movements. Some stairs have low steps and no landings, causing our bodies to move uprightly without pausing and turning. On the other hand, grand stairways with narrow risers and spacious landings invite slow and gracious movements, allowing us to pause at the landings and gaze out into the distance.

Movement is primordial in experiencing architecture, and that is why Pallasmaa [2013: 68] also reflects on the importance of experiencing the built environment in move-ment terms, because "basic architectural experiences have a verb rather than being nouns":

"A building is encountered; it is approached, confronted, related to one's body, moved through, utilised as a condition for other things. Architecture directs and frames behaviour and movement. (...) Authentic architectural experiences consist then, for instance, of approaching or confronting a building, rather than the formal apprehension of a facade; of the act of entering, and not simply the visual design of the door (...)"

Therefore, again, we can conclude that the feelings aroused are more important than the formal design. A quite poetic illustration given also by Pallasmaa [2013: 62] is the metaphor of the door handle in a building: "The door handle is the handshake of the building. The tactile sense connects us with time and tradition: through impressions of touch we shake hands of countless generations."

Indeed, architecture cannot be reduced to a rational conception of the art of construction, but it must embrace a metaphysical and existential approach, feeding from not only the eye, but from the feelings gained when touching, hearing, smelling, and even tasting. Architecture is the art of creating spaces, but more specifically, it is about imagining how life is carried out in the built environment and, more importantly, how it is experienced. It is about picturing human reactions and motives for pleasure: the most likely users' choreography when inhabiting the place, how the sun draws different shadows and conquers dark corners throughout the day, hearing the rain striking the roof as a percussion instrument, or feeling a gentle breeze refreshing the place and the spirit. Precisely for this reason, architecture is hard to explain but must be experienced, as Rasmussen [1964: 33] describes:

"It is not enough to see architecture; you must experience it. (...) You must dwell in the rooms, feel how they close about you, observe how you are naturally led from one to the other. You must be aware of the textural effects, discover why just those colors were used, how the choice depended on the orientation of the rooms in relation to windows and the sun. Two apartments, one above the other, with rooms of exactly the same dimensions and with the same openings, can be entirely different simply because of curtains, wallpaper and furniture. You must experience the great difference acoustics make in your conception of space: the way sound acts in an enormous cathedral, with its echoes and long-toned reverberations, as compared to a small panelled room well padded with hangings, rugs and cushions."

Hence, not only the used materials with their different textures and densities play a fundamental role in architectural design, but also the playful use of light and shadow condition how we perceive space, and they can be used to modify our behaviour as well. As illustrated in the book *Architecture Inside Out* [Franck and Lepori, 2000], when the lights are turned on in a night bar or in a lecture room, even if the professor is still speaking, a certain reaction is immediately generated. In the same way, by deciding what kind of illumination –how soft or homogenous it is– we can motivate one attitude or another:

a restaurant lighted with candles invites intimacy and seduction, while homogenous lighting can be suitable when the activities in the room have the same importance and are thus treated in an equal manner. Another example given by the authors is the Exeter Academy Library in New Hampshire, designed by Louis Kahn, as another great illustration of using light and shadow to emphasise certain behaviours: the reading area is placed along the window perimeter with natural light, while the books are located in the interior of the room and in a contrasted darkness. Therefore, the user must take the book from the dark to the light, recreating a brilliant metaphor of what happens when cultivating knowledge. The entrance, instead, is an empty lighted central space with some furniture where open books are exhibited, encouraging the user to become curious by some beautiful book laid open when passing by. As Kahn [1957: 76] himself wrote once:

“A man with a book goes to the light.
A library begins that way.
He will not go fifty feet away to an electric light.”

Similarly, the Austrian architect and scholar Christopher Alexander, in his celebrated book *A pattern language*, excellently describes how the use of light plays a fundamental role in architectural design and how people react to it:

“When they have a choice, people will always gravitate to those rooms which have light on two sides, and leave the rooms which are lit from only one side unused and empty. This pattern, perhaps more than any other single pattern, determines the success or failure of a room. The arrangement of daylight in a room, and the presence of windows on two sides, is fundamental.” [Alexander et al., 1977: 747]

Light and shadow, as seen, play an interesting role in how we perceive and react to architecture; curtains, shutters, shades, etc. are basic elements to experience architecture; thus, the architect should call them into play. In fact, how we arrange the openings in the spaces can have a direct effect on our behaviour, in the very same way that how we use the light-shadow contrast can affect our mood as well.

What is more important, if the built environment can affect our mood, it means that it can also have a direct effect on how we feel about ourselves, it can afflict our self-esteem, as it will be reasoned in followings sections. This fact becomes particularly significant when thinking about the materials used in the built environment: What feelings or sensations can they transfer to us? This question is easily understood if picturing the opposite feelings of working and/or eating on a wooden table vs. a glass or steel surface. Or the pleasant feeling of enjoying a ceramic cup of tea or a crystal glass of wine, compared to drinking from a paper or plastic cup. Or the warmth of walls covered with velvet versus the coldness of naked concrete walls.

Materials can give the impression of heaviness or lightness, of tautness or slackness. Depending on the material and the form given to it, the result can be a hard or soft construction: heavy materials with sharp edges vs. lighter materials. They could even be heavy also, but with curves and organic lines. All these distinctions are necessary aspects for creating and experiencing architecture. A public space in a city, for instance, can be designed in a hard way with a completely paved square and a lack of green, which generates unwanted heat in summer due the high sun exposure without shadows. Or it can be designed in a soft manner by introducing natural elements such as water and vegetation, which bring freshness and evoke an oasis within the city. The feelings evoked are drastically opposed.

We could find several more examples about how the use of different materials can provoke contrasting feelings, but what is important in the context of this dissertation is how this impact is especially significant if, due to our personal circumstances, we are forced to touch an unpleasant material, even though we would not like to do so. For instance, if a handrail is needed to climb stairs:

imagine the warmth of a wooden handrail versus the cold touch of metal, especially on icy winter days. Because, in the words of Alvar Aalto [1935 in Pallasmaa: 1984: 116], “[a] piece that comes into the most intimate contact with man (...) shouldn’t be constructed of materials that are excessively good conductors of heat.” Furthermore, following the same handrail example, not only the material warmth is relevant, but so are the ergonomics and the human performance, as already reported in the previous section Usefulness. Is the handrail hand-sized so that it easily allows a firm grip? Or is it narrow, sharp-edged and rude to the touch? Does the banister allow an uninterrupted guide and support along the stairs, or does it have stops at certain points providing the related feelings of unbalance and insecurity?

Alvar Aalto’s design of banisters becomes a great example of ‘care-for-the-senses design’, e.g., a brass banister bound in leather, so it feels both hard and soft, both secure and pleasant. It is worth mentioning that Aalto is not an example of barrier-free architecture, probably because it was not a concern in his epoch, but he was a great multisensory architect indeed. Thus, many of the sensory requirements for accessible designs are already met in his architecture. Once again using the same previous handrail example, he usually designed it in a continuous way, without interruptions between the floors, to provide a continued support. It would be only necessary to add small corrections to make it completely accessible according to current legislation, such as lengthening the handrail at its ends to provide support at the beginning or end of the movement, or to add a second handrail at a lower height for children, wheelchair users or smaller people. Although perhaps trivial in appearance, all these details are indeed fundamental for a vast variety of people: those with equilibrium difficulties, strength problems, arthritis, mobility impairments, low vision, or low cognitive development, among many others. Statistically, these people represent around 40% of our acquaintances.

To sum up, a good multisensory design is one that cares for the perception received from all the senses: How pleasant a surface is to touch is relevant for everyone, but very important to blind people and PRM. The acoustical properties of materials are equally important to bear in mind and are beneficial to everybody if properly designed; e.g., how easily conversations can be carried out without shouting in a restaurant, or how pleasantly silent a room is for concentrating or relaxing. Both examples depend on the reverberation level of the space given by the materials used. Providing visual access such as openings, partial walls and glass partitions in the built environment is highly important for deaf people [Byrd, 2007: online], but equally gratifying for people’s sense of enclosure and community with their surroundings. Even the olfactory qualities of the built environment are highly significant for people with sensory impairments who can use smell to locate landmarks, but they also equally condition the able-bodied’s perception of their surroundings, whether they be refreshing or annoying smells. However, as Steinfeld and Maisel [2012: loc.3363] acknowledge, “we do not yet have the technology available to manipulate smell as we do the other senses.” The most important is that by ensuring a multisensory experience of our built environment, we are increasing the architectural quality, the sense of wellbeing and, more fundamentally, we are closer to being an inclusive society.

5.2 Emotional wellbeing

5.2.1 Symbolism

Firstly, we must be aware of the natural rejection towards sickness and disability: As human beings, it is an instinctive response to avoid the idea of getting old, of contracting impairments, of becoming disabled and, finally, the idea of death.

The Franco-Bulgarian philosopher Tzvetan Todorov [1995: 59] describes how we are approaching ageing in modern western societies: “We fear death and anything that makes us think about it, and we prefer to put out of sight anything that reminds us of it. Old people are put in retirement homes where they see only other old people, (...) we try to prolong their life but not their existence.” Similarly, Pallasmaa [1983: 84] discusses the attitude towards ageing, reasoning it is a consequence of the industrialisation movement, where the ‘time’ factor is understood as a materialised commodity and experienced as a frustration. He states that this frustration is a result of the willingness of a timeless youth, which ends up in denial about ageing and everything related to it: “The natural and inevitable ageing of man, buildings and objects is repressed. In a welfare society old people are transferred to the outskirts of consciousness, ageing and wear are hardly conceived as design factors and objects of use are discarded before their old age.”

This common reaction towards the ageing and the elderly present in many cultures can be easily extrapolated to disabled people: we would rather escape from anything that reminds us of impairments and dependency, just because it is not a pleasant idea. “The old and the sick are pushed out of society’s sight and mind”, as Pallasmaa says [2001: 214], and the most likely reason for that is because they are groups that are easily stigmatized. In order to understand the origin, evolution and effects of ‘stigma’, and the perception of being a stigmatised person, *Stigma: Notes on the management of spoiled identity* [Goffman, 1963] is a good read. Goffman identifies three types of stigma related to the physical (body shape), the personal (character traits), or the social (group identity) characteristics of the person, all of them concerning people who society does not consider ‘normal’. Likewise, there are easily recognised stigma symbols as well, very diverse such as the colour of the skin, a hearing aid, a Star of David necklace, a collapsible white cane, a shaved head, a wheelchair, a burqa, or a grab bar. These symbols are commonly the objects of many generalisations, misconceptions, and wrong interpretations by ‘normal’ people, who often take for granted some preconceived ideas, usually in the form of prejudices.

In the specific scenario of disability, although the impairments and needs of PwD might notably differ, all are generally considered not ‘normal’; thus, they are often stigmatised people. “Likewise, spaces and objects associated with devalued or stigmatized groups can also carry stigma” [Steinfeld and Maisel, 2012: loc.596], and this is why a product that can be easily associated with the design for the disabled, although that may be more utilitarian, can also be rejected and avoided due to its underlying connotations. In fact, many accessible designs often repeat patterns easily associated with healthcare facilities and institutional life, that is, they have a clinical look in which disproportionate spaces and orthopaedic devices ignore one’s identity. In the words of Steinfeld and Maisel [2012: loc.586], “a patient in a hospital has to abide by the hospital’s rules, including wearing hospital gowns and eating prescribed foods. Hospitals, in fact, are uniformly disliked due to their active discouragement of identity behavior.” On some occasions, individuals can even feel detached from their surroundings, with no sense of belonging and discouraged to carry on.

Therefore, in order to really comprehend what signifies the ‘design for the disabled’, e.g., to be restricted to alternative entrances and segregated to specific areas full of orthopaedic aids for the disabled, it is relevant to delve into the underlying connotations attached by these spaces and the consequent effect on the user’s self-esteem. What is more, we must be aware that these feelings generated by how the built environment is designed can have a permanent effect upon certain people.

The North-American scholars Bloomer, Moore and Yudell wrote *Body, memory, and architecture* to introduce the fundamentals of the role of the body and the senses in architectural design. It was originally addressed to first-year students at the Yale School of Architecture more than twenty-five years ago. As one of the first studies addressing architectural experience and perception from the human body

with its derived emotional reactions, its impact on architectural theory was such that it is still broadly present in current academic texts as a basic reference, especially among phenomenological studies. Bloomer et al. [1977: 49] described how “we do develop memories of an inside world that include a panorama of experiences taken from the environment and etched into the ‘feelings’ of our identity over a lifetime of personal encounters with the world.” Or in Pallasmaa’s words [2013: 44]: “Our bodies and movements are in constant interaction with the environment; the world and the self inform and redefine each other constantly.”

These reflections become fundamental to understanding how constant contact with certain spaces can arouse particular feelings and affect our sense of identity. This is why many PwD who are forced to inhabit ‘accessible’ environments with a discouraging orthopaedic appearance see their identity affected by diminished self-esteem. In other words, many ‘designs for the disabled’ are discriminating, ugly and unwelcoming, thus it should not surprise us that their users might feel more insecure, weaker and even uglier. Furthermore, this unpleasant perception can unfortunately translate into a disagreeable attitude towards life. We must be aware that “we can never neatly separate what we see from what we know” [Gombrich, 1977: 331], in the same way that “[a] graveyard expresses sorrow, not because we are born with a tendency to look at a tombstone in a sad or gloomy way, but because we are socialised in a specific culture. We have learnt that a tombstone signifies death and sorrow.” [Kolstad, 2001: 124] Analogously, we easily relate accessibility with orthopaedic devices, which are associated in turn with sickness, dependency, hospitals, and finally death. The natural tendency is “‘with a simple glimpse’ to state what one likes or dislikes in accordance with one’s established knowledge structure and conceptions.” [Cold, 2001: 18]; thus, we cannot be surprised if accessibility is naturally disliked.

Likewise, regarding the customary rear entrances for the disabled, they also entail negative connotations, as described by Bloomer et al. [1977: 2]:

“The most important place on the house facade is **the front door, to which, almost always, there is a special stepping up**. On larger houses the entrance might be under a protective roofed porch, or below a fanlight or a dormer window projecting from the attic, all of which draw connotations of upness to the passage in. **The rear**, meanwhile, is not at all like the front. (...) The attention, **with all the expected anal implications, is to service, trash removal, and privacy.**”

Thus, not only do rear entrances evoke feelings of being secondary and worthless when compared to the main entrance, but *‘almost always, there is a special stepping up’* to the front door. That is, stairs are traditionally used in building entrances, and their presence also hold some symbolism: the meaning of ascending, of highness, is related to the heavens, the gods, kindness and strength; while the idea of descending to lower depths arouses feelings of inferiority, mediocrity and weakness. Indeed, we can find several architectural theorists, such as the ones quoted below, who talk about these associations: “up derives a set of connotations (including moral ones) opposite from down. In our minds left and right soon become distinguished from each other in quality as well as in direction, as words like ‘sinister’ and ‘dextrous’ record.” [Bloomer et al., 1977: 1] Pallasmaa [1983: 85] also writes about it and quotes, at the same time, other authors addressing the issue:

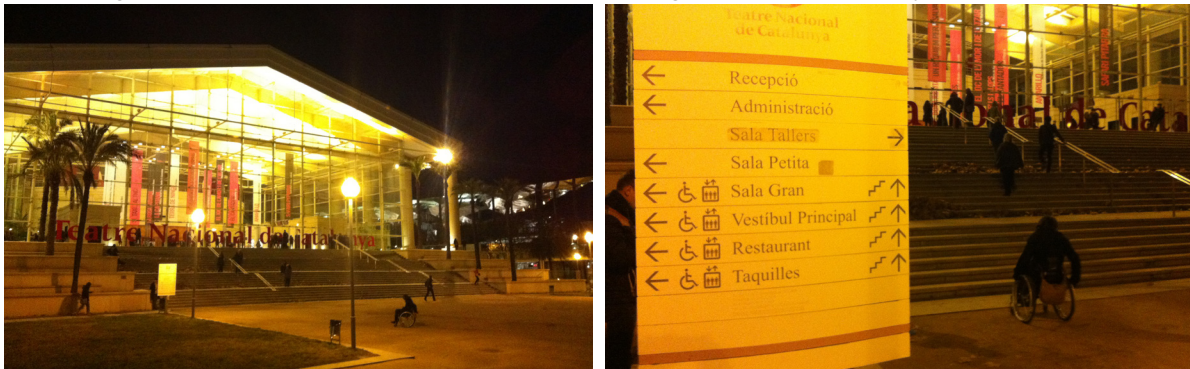
“Each spatial direction –up, down, in front, behind, right, left– has a separate meaning. Vertical has a fundamentally different meaning than horizontal. ‘Even those who have long since ceased to believe in heaven and hell cannot interchange the words “above” and “below”.’ The psychoanalyst Fred Fischer has inferred that the unconscious significance of the different spatial directions are imprinted in the human psyche already at the embryonic stage.”

Hence, stairs have been widely associated to the process of ascending, arousing connotations of majesty and power, almost eternally in our human existence. Only recently in the last century have stairs begun to be considered an architectural barrier. Defeating this belief that is strongly tied to our deep

subconscious is not an automatic response that can be achieved immediately today or tomorrow. The powerful symbolism of ascending still remains, in such a rooted way that stairs are often still conceived as fundamental in the design of the entrance of certain buildings.

A clear example of this is the National Theatre of Catalonia (*Teatre Nacional de Catalunya* - TNC), designed by the prestigious architect Ricardo Bofill. It was inaugurated in 1996, one year after the Catalan accessibility code was enacted. Perhaps due to this short time period of accessibility consciousness, the theatre was designed with monumental stairs at the entrance (see the left-hand image of Fig.41 below). This resulted in the customary secondary accessible entrance for disabled people (see the right-hand image of Fig.41 below).

Figure 41: National Theatre of Catalonia: main access through stairs, with a secondary entrance for PRM



Source: TNC, Barcelona, Spain. [Own material]

When this solution of placing stairs in the entrance of a building is used in new constructions, e.g., in a hotel where the clients most likely will bring luggage that is difficult to carry up stairs, one cannot avoid asking why and for what purpose. Unfortunately, this happens far more than expected, like the Wakeup Copenhagen hotel (Denmark), designed by Danish architect Kim Utzon (son of the famous Jørn Utzon) in 2009, which is located on a flat site. Thus, despite there being no need to solve any height unevenness of the ground, the entrance is preceded by a long staircase leading to the main hall. On the left, after a short corridor, a lift is offered to PRM, which is, obviously, used by many other able-bodied clients as well. The following Fig.42 displays the main entrance of the Wakeup Copenhagen hotel.

Figure 42: Main entrance of Wakeup Copenhagen Hotel; by Kim Utzon



Source: Copenhagen, Denmark. [Own material]

Somehow, it seems that connotations of ‘great dignity’ or ‘spiritual reward’ are still so influential in our subconscious that we cannot live without stairs. Unfortunately, the underlying reading of it—even if it is obviously not true—is that those who are unable to use the stairs are not elegant enough, not graceful enough, and perhaps just not worthy enough. What is more, rear entrances can signify a strong and continued impact on PRM on how they perceive the built environment, since “the subconscious structures and meanings” of the built environment are “crucial for our well-being and health” [Cold, 2001: 35].

Hence, the architecture ‘for the disabled’ must be rethought, because all its latent symbolisms (segregation, secondariness, ugliness, etc.) strongly affect the user’s self-esteem and, furthermore, it is a clear barrier for reaching inclusive architecture for all. Furthermore, caring about the perception of our environments (i.e., how nice they feel) signifies an increase in happiness, which is related with health as well. Departing from the *Alma Ata declaration*’s definition of health, which is more or less identical to being happy and having good wellbeing, Kolstad [2001: 128] explains:

“There is also another indirect route to better health, namely to increase self-esteem by identifying oneself with high valued aesthetics. Health also depends on self-esteem and a feeling of being a worthy person. Beautiful environments also make us feel more valuable. The perception of ourselves, who we are, depends partly on the environment that we are part of.”

This idea is important to bear in mind, due to its deep implications: our surroundings symbolise to us and to others who we are. “Material possession represents our personality, social standing and wealth, but also our values, history and relationships to others” [Niinimäki and Koskinen, 2011: 166]. For this reason it is not superfluous at all to denounce the lack of equality and multisensory conception of accessible designs. On the contrary, they must be equally functional and aesthetic, pleasant to all the senses, as will be argued next.

5.2.2 Aesthetics

As seen in the previous section, accessible designs can be perceived as symbols of declining ability and can therefore be easily rejected by the able-bodied community, who do not want to be perceived as less able, old or impaired. A great part of the problem of this rejection lies in the lack of a welcoming design of accessible solutions which ignore self-image issues. Thus, in short, people tend to abandon accessible designs even if they could benefit from them because of a lack of aesthetics.

Accessible designs are too often exclusively focused on pragmatic concerns that are mainly conceived for usability but forget about beauty. The irony here is that “people perceive more-aesthetic designs as easier to use than less-aesthetic designs—whether they are or not”, as defined by Lidwell *et al.* [2010: 20] under the title ‘*Aesthetic-Usability Effect*’. The reason for this is that aesthetic designs awaken positive attitudes and even make people more tolerant of design complexity and more willing to invest the necessary time to learn how to use them. Why such phenomenon happens is because all design conditions emotional responses, as extensively described by the academic Donald Norman [2004] in *Emotional Design: Why We Love (or Hate) Everyday Things*. It is worth noting that previous to this book, Norman [1988] wrote *The Design of Everyday Things*, where he popularised the term ‘user-centred design’, and received good reviews praising the work for better ‘user-friendly products’. In contrast, he also received judgemental commentaries from designers who criticized Norman’s prescriptions for leading to usable but ugly designs. Norman accepted such judgements, acknowledging

that besides utility, function and form, the emotional aspect of design are equally important in design's usability, as he explained in the prologue of *Emotional Design* [Norman, 2004: 8].

Therefore, a good emotional response that is influenced by aesthetics, attractiveness, and beauty contributes to usability. But, what is beautiful? Beauty can be understood as a platonic ideal, found in mathematical relations, in the equilibrium of dimensions, in proportion, symmetry, the golden section, etc. Beauty is also often related to the natural world; people generally feel more attracted to natural elements than to built ones, as strongly supported by several empirical studies, and “the major distinctions people draw between places is whether they are natural or man-made. Invariably the natural is preferred to the man-made” [Canter, 2001: 50]. Analogously, handcrafted objects are often considered more beautiful than industrially manufactured products. For others, beauty is purely a social construction: there is nothing which is beautiful per se; we learn to see certain things as beautiful in the process of socialisation. Regardless, beauty is something which arouses feelings and emotions; it is not so much conceived intellectually, but it is experienced sensually, bodily, and many times also unconsciously.

In this respect, it is important to be aware of the influence when one is exposed to a “pure sensuous-aesthetic perception”, e.g., a field of flowers suddenly found in an immense landscape, which “calls immediately upon our emotions”, as explained by the Norwegian architect and scholar Birgit Cold, editor of *Aesthetics, well-being and health*, a volume gathering several essays from interdisciplinary professionals and academics who debate about how aesthetics affect us emotionally and physically. Cold [2001: 15] goes on to describe “the difficulty in separating the direct, aesthetic-sensuous perception from the cognitive, intellectually reflected consideration and assessment.” Thus, beauty and its antonymous counterpart, ugliness, are closely associated to emotions and mood states rather than rational thinking.

Already in 1910, Adolf Loos [2007: 84] defended a similar idea about how the design of the built environment has great power of communication and affecting people, i.e., “stimulating human moods” (“*Stimmungen*”). Accordingly, Loos explained how architects should enhance particular qualities in order to transfer certain meanings:

“Architecture arouses moods in people, so the task of the architect is to give these moods concrete expression. A room must look cozy, a house comfortable to live in. To secret vice the law courts must seem to make a threatening gesture. A bank must say, ‘Here your money is safe in the hands of honest people’.”

Likewise, the contemporary Swiss-British philosopher Alain de Botton explores the essence of architecture in his book *The Architecture of Happiness* [de Botton, 2006], discussing the importance of beauty in our built environment, whether we aim to have helpful visions of ourselves and to sense the perception of a ‘good life’. But more importantly, he claims that designs can support impressions of certain psychological and moral attitudes, and this is very important to compensate for vulnerability. According to de Botton [2006: 98], all spaces and objects—with their different shapes, materials, colours, and textures—hold hidden connotations and ideas that are transferred into the values we want to live by.

“The buildings we admire are ultimately those which, in a variety of ways, extol values we think worthwhile—which refer, that is, whether through their materials, shapes or colours, to such legendarily positive qualities as friendliness, kindness, subtlety, strength and intelligence. **Our sense of beauty and our understanding of the nature of a good life are intertwined.** We seek associations of peace in our bedrooms, metaphors for generosity and harmony in our chairs, and an air of honesty and forthrightness in our taps.”

What is more, as de Botton [2006: 117] also describes, there is also a hidden moral symbolism lying under the beauty and the ugliness, suggesting connotations of goodness and evil, respectively:

“[Theologians] proposed that beautiful buildings had the power to improve us morally and spiritually. (...) A beautiful building could reinforce our resolve to be good (...) an equivalence between the visual and the ethical realms. Attractive architecture was held to be a version of goodness in a non-verbal idiom—and its ugly counterpart, a material version of evil.”

Therefore, there is also a latent relationship between beauty and justice, i.e., aesthetics and ethics. When accessibility is designed only for usability but not taking into account aesthetics, PwD who are forced to use such ugly environments can easily feel bad, with a negative attitude toward life. The architect's duty should be to care about everyone equally.

In addition, it is important to bear in mind that the mood states have a highly infectious character, in the same way that smiles and laughing are contagious, as Kolstad explains in his contribution to *Aesthetics, well-being and health* [Cold, 2001]: “There is a synergetic effect when people come together and are subject to reciprocal impacts”. Thus, when disabled people feel discriminated by design and share it with other disabled, it becomes no other than a multiplier effect. Also, this principle is important for comprehending aesthetic preferences, fashion and common taste: “When something is looked upon as beautiful by somebody, this increases the possibility that other persons exposed to these preferences will react in the same manner” [Kolstad, 2001: 119]. Comparably, all the negative underlying connotations and latent meanings that the built environment may arouse must be, therefore, carefully defeated, especially when they suppose vulnerability, since it can entail a global decrease in the society's self-esteem. Kolstad [2001: 127] concludes: “Beautiful environments increase our well-being and positive mood, and this, in turn, influences our health in a positive manner and enhances the healing process.”

Thus, for high self-esteem and wellbeing, it is advisable to promote aesthetic universal designs, introducing indispensable aspects of beauty and empathy. The adapted products need to look attractive and not orthopaedic: they need to be desirable, and also homely-looking, providing a sense of comfort and the perception of a good life. This question is very important for elderly people, who do not want to feel restricted by their impediments; a proper design of the environment can help to minimise the feeling of being ‘disabled’.

To sum up, accessibility must address usability and aesthetics in an intertwined way. Stigmatising designs must be avoided because the emotional dimension of design is truly important for inclusiveness. As Steinfeld and Maisel [2012: loc.3672] explain, the art of construction would benefit from research on emotions; however, there is usually a lack of time or money to conduct such extensive research. In response, design participation is an excellently alternative means for obtaining such information about emotional responses, mainly because emotions must also be understood within a cultural context, i.e., the sense of beauty might notably differ from one culture to another. This is also why flexibility in the ability to personalise designs is fundamental in universal design, both in terms of aesthetics as well as function.

5.3 Limits

5.3.1 Affordability

Another critical factor in accessible design is its affordability. Often, larger spaces translate into higher prices; thus, it is essential to be very precise in determining “how much space is really necessary to complete an activity or task in order to avoid wasting space and money.” [Steinfeld and Maisel, 2012: loc.2847].

In order to illustrate this problem, let us address the topic of accessible public toilets: The unisex accessible restroom was originally developed to reduce the cost of making both men's and women's restrooms accessible in existing buildings. For some reason, it was labelled as the 'third sex' (toilets for males, for females, and for the disabled), maybe due to overly strong disability rights movements who perceived it as a discriminatory solution and felt the need to fight for it. Thus began a new tendency to build accessible toilets within the men's and women's restrooms. However, probably due to a lack of space and/or in order to economise the project, it was frequent to find the accessible toilet only in one of the two genders, thus imagine the discomfort of the user of the opposite sex when having to enter the place; e.g., picture a woman having to enter the male toilets with open urinals along the wall leading to the accessible water closet.

This bad practice was soon amended, and accessible toilets were either built in both the male and female restrooms, or in a separate unit. The polemic about which is the correct way still exists; some users complain that the latter is often discriminatorily segregated from the rest, while some others defend that accessible toilets should be precisely separated in different units so that they can be used by mixed sex couples or family members to assist their relatives. In fact, having a bigger toilet with a direct entrance from the general public area –and not from the restricted gender area– is more functional for manoeuvring with a larger wheelchair, with a scooter or with some other larger walking aid device. What is more, it is also beneficial for several other situations, such as single-parent families assisting their children.

Most likely, the problem of accessible toilets lies in their naming and signage, often called handicapped restrooms and indicated with the wheelchair symbol, hinting at the controversial 'design for the disabled'. Instead, they should be called differently, like 'family restrooms' for instance. The idea is to find a name and icon more inclusive, referring to the space offered which is bigger and allows more options like entering with kids, assistance, or luggage that cannot be left unattended. In fact, many accessible toilets are often equipped with baby changing facilities and most of them are big enough to allow uses as the ones just described. Thus, the problem concentrates on its signage, only indicated with the wheelchair symbol. Fortunately, this renewed approach towards family restrooms is starting to spread. Albeit often only found in large public buildings such as airports and museums, it is already possible to find some examples of family toilets signage, which of course, are also accessible to PwD (see next Fig.43). Needless to say that this solution of combining multiple users in one same design, means saving space and thus saving money.

Figure 43: Example inclusive signage: family restrooms, which are accessible



Source: [Hendren, 2011: online]

Furthermore, in terms of affordability, it is worth remembering the UN-CRPD definition of UD as: “the design of products, environments, programmes and services to be usable by all people, to the

greatest extent possible, without the need of adaptation or specialized design.” [UNE, 2007: Article 2]. In this definition, it is important to highlight ‘*without the need of adaptation or specialized design*’; that is, we need to avoid specific products for a minority, which is usually the misconception of accessible products.

We can easily picture this affirmation with accessible rooms in hotels. Unfortunately, there are many hotels offering accessible rooms with disproportionate spaces that are much larger than needed. Even with wide doors and low furniture that end up being completely useless, e.g., with doors that are too wide and which cannot be closed from the inside, or basins that are too low and cannot be frontally approached in a comfortable manner. The irony here is that often the rest of the rooms in the hotel do not usually have these problems, being of standard measurements and suitable for all. Among many others, this was the case of the hotel pictured in the following Fig.44, where the ‘special design’ found in the accessible room had a rather large but incorrectly designed bathroom, with a too low basin, while the rest of the rooms had smaller bathrooms with higher basins that are suitable for all.

Figure 44: Incongruity of design: (left images) the accessible room has a too-low basin = inaccessible; (right images) the standard rooms have standard basin = accessible



Source: Chateau du Mazan, France. [Own material]

What is more, the incorrect design of the accessible room was not only the low basin, but also the lack of a seat in the shower. As the reader can see in the previous images, the bench is too high for a wheelchair user, so a conventional chair was requested to get around the problem. However, it must be pointed out that such a solution can entail security problems, since the chair is not fixed in its position and the surface gets wet when taking the shower, which means it can easily slip. Instead, the standard room could be easily converted into an accessible room simply by replacing the existing shower with a walk-in shower and adding a fold-up seat. Aside from the discomfort of the client using this incorrectly designed accessible room, he/she must additionally pay a more expensive price because, unfortunately, the larger the space provided, the higher the price. “Hotel rooms demonstrate this relationship dramatically”, Steinfeld and Maisel [2012: loc.2842] corroborate.

As seen, many hotels might offer only one or two ‘accessible rooms’ while, often, the rest of the rooms could be usable and easily adapted following some specific criteria about spaces, surfaces, edges, handles, opening mechanisms, lighting, colours, etc. In comparison to the example described above, a case of good practice is the hotel Silken Zentro Zaragoza (Spain), whose clear policy of integration offers several ‘polyvalent rooms’. These are rooms correctly dimensioned, with soft colours, proper lighting, and with walk-in showers equipped with a fold-up seat (see Fig.45 below). It is worth noting their smart strategy in naming: the *polyvalent rooms* are sold to all clients, who do not know that they are in an ‘accessible room’ or a ‘room for the disabled’, but merely in a comfortable and pleasant space. One more added gain is the price of the room, they are equally affordable, and the hotel receives more benefits because all clients regularly use it.

Figure 45: *Polyvalent room*: the design of the bathroom is accessible to PRM, thanks to the roll-in shower, fold-up seat, and handles; only the mirror height needs improvement by making it lower



Source: Hotel Silken Zentro Zaragoza, Spain. [Own material]

Therefore, architects and interior designers must think about flexibility in use and modular spaces that are able to respond to the diversity of the demands, without creating specific places for specific people, which implicates segregation and discriminatory solutions and requires extra money and space. Indeed, accessible products are often the most expensive, because they are still conceived as something special, not as a normal and standard service. Thus, there are not enough offers on the market; i.e., only a few high-class hotels offer these kinds of facilities. The core of the problem lies in the fact that accessibility is described in the accessibility codes mandated by law, but its holistic comprehension –whether it be called universal design or inclusive design– is not contemplated with broader concepts of usability and aesthetics, among others. Furthermore, “accessible design regulations create the illusion that only people with disabilities need increased usability and safety. This belief has two consequences”, as Steinfeld and Maisel [2012: loc.1977] describe:

- “1) Designers perceive that the demand for accessible products and environments is in ‘niche markets’
- 2) Providing better access is seen primarily as a regulatory or clinical matter. Thus, designers and manufacturers (...) believe that it is a problem for a small group of specialists to solve rather than an opportunity for creative design.”

A change in the overall thinking is necessary, which will be progressively achieved if we introduce its proper learning in the academic context. The fact is that there is often resistance to implementing accessible solutions understood in an inclusive manner, because as Steinfeld [2006b: online] says: “To many producers, in particular, it appears to be an unaffordable luxury or a competitive disadvantage because it may increase the cost of a product or environment. In other cases, the effectiveness of innovative solutions using UD concepts is not known.” In consequence, accessible facilities are often designed specifically for a minority and as special products, not for the whole population. Often, due to a misunderstanding of the requirements, the results are exaggerated designs and disproportionate spaces that are often ugly and clinical-looking. In order to achieve ‘normal prices’ for all, we must redesign existing products for universal use, because accessibility is not about special designs for a minority, but universal designs for all. The target is to promote clear and beautiful design, innovating flexibility of functions and using high quality haptic materials. Only through these means will we defeat stigmatisation and social and economic discrimination.

It is true, though, that we are subject to current industrial mass production, especially when addressing the design of technical aids. Looking back in history, as a consequence of the industrialisation process, men became subject to the will of economic market values clearly tended to opt for the more

economical over their other emotional concerns. On many occasions, the possibilities offered by new technology and its economic benefits have been prioritised over the emotional benefits; the faster and more profitable path has been chosen at the expense of perceived wellbeing and comfort. In fact, Modern Architecture places functionality and profitability before human values and the existential needs of users. A clear example can be found in Le Corbusier's *Vers une architecture* [1923], where in the section addressing modern housing he mainly talks about industry, mass-production, low-cost, and the functional programme, but says very little about the inhabitants of this housing of the future, what they expect and how their needs can be met. Thus, those 'supra-functional needs' are not discussed. These include emotional, spiritual, social, aspirational and cultural aspects [Weightman and McDonagh, 2003]; in other words, they consider how people perceive their surroundings, which translates directly into wellbeing.

According to Cold [2001: 5-6], the problem of industrial mass production of goods and environments based on a rational, cost-benefit view is that the emotional dimension of design is not present. Thus, we often "do not identify with or care for mass-produced entities." Albeit nowadays there are many examples of product design where cost is not the main concern but a friendly use is (for example, Apple's user-friendly software), this is not so in the general case of built environment design. Current architecture is notably gripped by materialistic values, rational thought and low-cost exploitation. "Intense competition on price inevitably led to the adoption of simple basic forms with limited variety, easy to manufacture in vast quantities at extremely low prices." Furthermore, "these products are often poorly designed for comfort, health, and convenience, are prone to failure, and have a short life due to the emphasis on competitive pricing, fashion cycles, and planned obsolescence" [Steinfeld and Maisel, 2012: loc.1040].

Transferring this discussion to the context of accessible design, the consequences are even more extreme: Accessible solutions are standardised, mainly in the form of orthopaedic aids that are metallic, cold, and impersonalised. As they are approached under the conception of 'design for the disabled', the target group is a reduced minority, which translates into little offer on the market. Thus, they are more expensive. In addition, these products are rarely aesthetic because this is generally not a major concern. The consequences are that all aids, complements and mechanisms are identical, ending in rooms that look very much the same and which become places where one feels like a nobody. The result is a strict homogeneity that wipes away the sense of place, belonging and being.

Nevertheless, the question of the affordability of accessible products remains and entails a political approach. Regrettably often, we pay more attention to the immediate economic burden of implementing accessibility, rather than calculating the savings thanks to forecasting future needs (partly because they are difficult to estimate). For instance, it is roughly estimated that the cost for living in a small new apartment has been incremented around 3-4 % since the Finnish standards demand making bathrooms wheelchair accessible, which inevitably opens a window for debate: Are there any upper limits? Should all new apartments be accessible or only a percentage of them? Should it be a decision to be made by the owner or it is a political question that must be addressed united as a society? It would be very useful and convincing to have real studies proving true or false the conventional wisdom that says '*what's cheap turns out to be expensive*', because the fact that present expenses are higher does not necessarily mean that we are paying more. Rather the contrary, most likely, to leave the problem for tomorrow will translate into higher expenses in the future.

Let us address one last example reasoning the economic cost vs. the benefit of implementing accessibility, to conclude the affordability discussion: As the reader can see in Fig.46 below, in some

stations in the Barcelona metro (Spain) the platform and the train are not at the same level, so a step must be overcome to access the vehicle (left image). The solution has been to build a platform hump (right image), which consists of raising part of the platform in order to minimise the vertical gap between the platform and the train, so that a flat access is provided. This platform hump is placed only at the end of the platform and not for all its length. Thus, on the one hand, the user feels labelled and discriminated to a certain area, but on the other hand, people often crowd around this little area, probably because it is normally in the nearest position to the lift and escalators.

Figure 46: Barcelona metro: (left) vertical gap between the platform and the train; (right) platform hump, which consists of a partially raised platform to equal the train level



Source: Barcelona Metro, Spain. [Own material]

It is worth noting that on other occasions the design has been reduced to attaching a metal ramp (see Fig.47 below), which is an even worse solution because it means to overcome the gap being on an inclined surface, with the great difficulty that this entails when on wheels. This is another example of a partial and reduced ‘design for the disabled’, which can mean dependency on others since it might require the participation of third persons to climb the ramp and cross the vehicle’s door in this case.

Figure 47: Barcelona metro: inclined metal ramp to provide ‘accessible’ access to the vehicle



Source: Barcelona Metro, Spain. [Own material]

Raising the whole length of the platform instead of only a partial area would certainly mean that all passengers could board and alight the vehicle with less difficulty, although it would most probably be an expensive solution. It would be interesting then to estimate if making an accessible embarkation could reduce boarding/alighting times, and thus the vehicle would not need to stop so long at each station. Consequently, the frequency of vehicles passing could be increased and, thus, more profits would be generated. Accessibility means better business results simply because the reach of people is extended. This affects PwD directly, and people with other special or circumstantial needs indirectly, and the latter is often forgotten.

Indeed, the Accessibility Research Group from the University College London (ARG-UCL) has carried out similar studies in the UK's London Underground for several years already. In 2008, research results were published about the terminal dwell time, which is the amount of time that the vehicle remains stationary at a station before continuing. They studied the relationship between the boarding/alighting speed, the gap size and the door width [Fujiyama *et al.*, 2008]. In 2011, a UCL research study confirmed that raising the whole platform (instead of a platform hump) and also widening the vehicle's doors to 1,80m would ease the boarding/alighting of passengers, which would become beneficial to both operator and passengers. That is, the project is considered economically viable in the understanding that benefits would exceed costs [Karekla *et al.*, 2011: 93]

5.3.2 Levels of accessibility

When addressing the topic of accessibility, it is important to note that it is equally necessary to provide equal access as to inform of such access provided. Furthermore, since accessibility, as seen, is object of varied opinions and approaches, it becomes essential to provide detailed information of such accessibility; that is, to inform the user what is actually offered, and to what degree.

For instance, if thinking about mobility impairments, it is quite different to state that something is not accessible because of a single step or due to a set of stairs. In the first case, it will affect a lower percentage of users, while in the second case the most likely scenario is that the percentage of people who are unable to use the place will rise to higher levels. It is important to understand that not all people recognised as 'disabled' have the same abilities; on the contrary, the diversity of abilities is quite vast. Thus providing proper information is a much better answer than standardising problems and relying on the famous 'handicapped accessible sign', which by the way is reductionist and not inclusive to all people with special needs.

In addition, on many occasions where accessibility is not completely compulsory, the easy and unfortunately most frequent response is to just avoid labelling the place as accessible. In contrast, it is rather preferable that if a place is not completely accessible but is easily managed and with little help, then it should be indicated as such: 'accessible with help' or 'practicable'; rather than labelling it categorically as accessible or not accessible. In fact, this way of thinking is already present in some countries, such as the UK, where the *Inclusive London* website uses different signage (see Tab.7 below) for displaying information, specifying many factors that can be important for people with special needs.

Table 7: Example of detailed signage informing about several accessible features

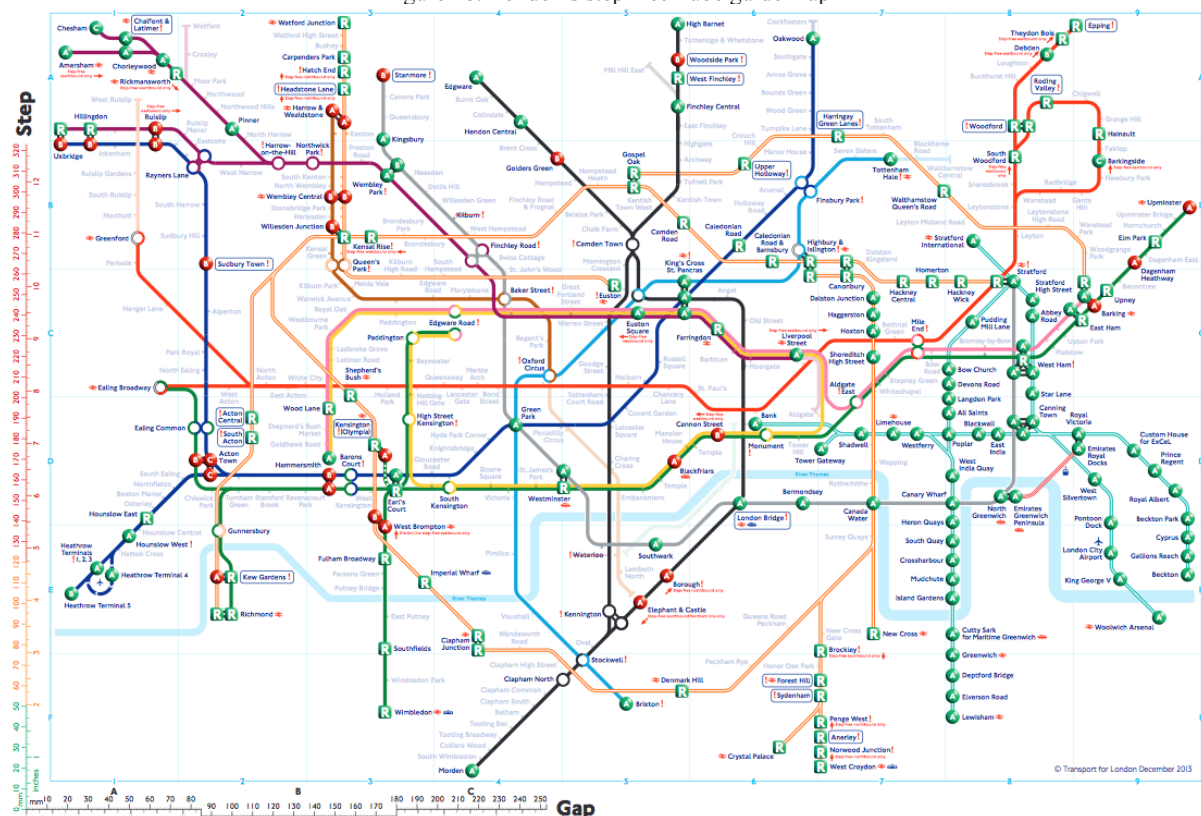
| Accessible signage used in Inclusive London website: | | | | | |
|---|--------------------------------------|---|---------------------------------------|---|-------------------------------------|
|  | Facilities for the visually impaired |  | Accessible toilets |  | Accessible car parking |
|  | Facilities for the mobility impaired |  | Sign language for deaf people |  | Low Payments Counters |
|  | Assisted wheelchair access |  | Facilities for hard of hearing people |  | Parent with pushchair access |
|  | Non assisted wheelchair access |  | Induction loops available |  | Baby changing facilities |
|  | Assistance dogs welcome |  | Customer car parking facilities |  | Accessible baby changing facilities |
|  | Customer toilet facilities |  | Staff assistance |  | Alternative languages available |

Source: Own elaboration based on InclusiveLondon.com

The Inclusive London website is an example of excellent practice in providing complementary and detailed information, which demonstrates a remarkable attitude and quality of service. Clients can filter their search on the web by selecting which requirements are indispensable, depending on their personal circumstances; thus people with special needs will surely use this search engine above others without specific accessible feature descriptions. Another example from the UK is the step-free tube map in London. London has quite an old underground transport structure, “it was the first underground system in the world and was built a long time ago when little consideration was given to accessibility” [Karekła *et al.*, 2011: 93]. Because of this, mostly all the stations are not accessible. Much effort has been made in converting the tube system into accessible transport, but unfortunately there are many stations that, due to diverse complex factors (curved platform design, platform height, etc.), it cannot be modified. For this reason, the step-free tube map (see Fig.48 below) has been created to provide passengers with the most detailed information, so that each user can decide whether or not they can overcome the specific obstacle.

Reading the map is not immediately easy and intuitive. Indeed, there are quite extensive instructions on how to use the map. Basically there are three colours indicating step height between the platform and the train: Green = 0-50mm; Orange = 51-120mm; and Red = over 121mm. What is more, the gap between the platform and the train is indicated by the following letters: A = 0-85mm; B = 86-180mm; and C = over 181mm. Then, colours and letters are combined according to each situation. In addition, the R symbol is used to indicate that ramps can be pre-booked to help the user board the train. Furthermore, there are several combined symbols to indicate whether the connection between lines is step-free (sometimes only in one direction), as well as to inform whether there is only one step-free entrance to the station, depending on the direction of travel. In the station index on the back of the map, the specific description of each station is provided, specifying the exact dimensions of steps and gaps, paths to possible connections between lines, etc.

Figure 48: London's step-free Tube guide map



Source: [Transport for London, online]

Although this effort of providing precise information cannot be underestimated and it shows a substantial commitment to mobility for all, the result is still that full accessibility is far from being reached yet. A quite common mistake is assuming that when a service provides information concerning accessibility, this means that accessibility is actually provided, which is not necessarily true. In fact, the accessibility of the London Tube is far from ideal; even the best accessible level, classified as Green A, can have as much as a 50mm step and a 85mm gap, which can be inaccessible for many users. Some criticisms about the real accessibility, as well as the complexity of information provided, can be found on the web, some with a touch of humour, as Fig.49 shows:

Figure 49: Parody of accessible signage for the London Tube



Source: <http://diamondgeezzer.blogspot.com.es/2011/09/step-too-far.html>

The fact is that accessibility can be provided in different levels or understandings; that is, spaces can be designed so that they can be used in an easier way or with more effort. On this matter, let us address the example of accessibility standards in the Spanish territory:

Firstly, it is important to clarify that the Catalan regulation from 1995 differentiates between the concepts 'accessible' and 'practicable', with the aim of extending accessibility 'as far as possible'. For instance, understanding that if there is no space for the 1.50m diameter requested for an accessible turning area, a minimum turning area of 1.20m diameter can be considered 'practicable'; i.e., not 100% of wheelchair-users will be able to use that space but at least many of them will. This consideration, which in my opinion is very pertinent, has been the object of controversy to the point that a new Spanish regulation on the topic, approved in 2010, has specifically eliminated this concept under the idea of not discriminating some disabled users. To the Spanish understanding, the 'practicable' concept becomes 'second-rate accessibility', which must be avoided.

Obviously, this reasoning can be very much discussed. On the one hand, I believe that the root of the problem lies in the fact that, under the idea of providing adaptations that go 'as far as possible', albeit not being completely accessible, a 'false accessibility' has been generated as well (like the ramps are too steep, the presence of isolated steps, etc.). It is an important issue, the dilemma of whether to facilitate 'as far as possible' the use of spaces for all people or to incorrectly adapt places and offer them as accessible ones. Regrettably, under the 'as far as possible' conception, the indirect result is that we end up accepting inadequate solutions, even when a better solution is indeed possible.

On the other hand, it is true that on many occasions 'second-rate accessibility' is perceived, like the many examples where the solution of providing an accessible entrance to a building is reduced

to locating a ramp at a little-used side doorway, where it is easy to place and it does not disturb. Still nowadays, regrettably, many ‘back-door entrances’ are the solution to solving the lack of accessibility of the main entrance to an existing building, primarily due to heritage protection policies. How to balance the rights of people and the duty of heritage preservation is indeed a complex field (as it has been further explored in the case study of this dissertation), but the fact is that these ‘back-door entrances’ are often through restricted areas of the building, entailing several problems, as follow.

If the ‘accessible’ entrance is a secondary entrance limited to auxiliary uses, the visitor will more likely have to ring a bell, if one exists, or be at the mercy of having somebody call the person responsible to open the secondary access. Thus, the non able-bodied depends on the availability of the staff, which in turn can infer security problems in particular buildings. What is more, ‘back-door entrances’ are often located where the loading and unloading of goods is carried out, since they are *per se* barrier-free (e.g., loading of instruments, scenery, etc. in the case of a theatre; loading of food and beverages in the case of a restaurant or a hotel; etc.), thus they can be subject to differing opening times from the main access. This fact can turn out to be a great barrier if, for instance, the accessible entrance in a hotel is made through the restaurant (e.g., Hotel Epoque in Pietarsaari, Finland), or even the kitchen (e.g., Base Brisbane Central Hostel in Brisbane, Australia), and the guest arrives after the closing time of that entrance.

Both accommodations are advertised as accessible on the major search engines, such as booking.com or hotels.com; thus the visitor has an unpleasant surprise at his/her arrival. The problem is that there is no control over the criteria for describing accommodations as accessible or not: that is to say, whether or not the accessibility was evaluated by an expert on the topic. The reason for this current lack of reliable information about accessibility on the net might lie in the deficiency of knowledge as to what ‘accessible’ accommodation is: it is not so rare that agents are unaware of the real requirements of accessibility, so they cannot provide a true evaluation.

What is more, as Steinfeld and Maisel [2012: loc.2633] denounce, “any business can claim that it is offering universal design products and services” nowadays, thus the users cannot really rely on the information provided. Despite the evident discrimination connotations comparable to the ‘separate-but-equal’ conditions faced by African Americans already described, the gravity of the problem lies in the fact that these kinds of solutions to accessibility are considered legal (or they were at the time). Hence, a reductionist barrier-free approach with secondary entrances like the ones described, can lead to ‘accessible’ solutions that, although discriminatory and clearly still with barriers, are allowed and considered licit.

To conclude, what is necessary is a full comprehension of the required accessibility standards, together with a dose of creative thinking, for high quality inclusive built environments. The following example illustrates how different levels of accessibility can be provided, without undermining neither the design nor their users:

According to newer accessibility standards, an 80cm clear space to facilitate the wheelchair-toilet transfer is required on both sides of the toilet. The reason for this requirement is to facilitate the transfer to everyone, so that in the scenario of a person paralysed on one side, for instance, he/she can transfer from the other side. This requirement aims at the greatest possible inclusive solution, but it entails the use of larger spaces, which can be polemical in economic terms. In this respect, it is worth introducing the solution designed by the *Invalidiliitto* corporation previously presented: While on the ground floor and off a larger corridor with easy access, a larger unit with clear space on both sides of the toilet can be found (see upper images of next Fig.50). On the other floors of the building, two unisex

accessible units are offered in a mirror display; that is, one unit with free space on the right side of the toilet, and the other one on the left (see bottom images of next Fig.50), which are indicated accordingly by signs. This strategy becomes an excellent inclusive example of space optimisation, since both side-transfer options are offered by using less space.

Figure 50: Examples of unisex accessible toilets: (upper images) bigger unit for scooters or larger wheelchair users; (bottom images) duality of accessible toilets, for left- and right-handed users, respectively



Source: *Invalidiliitto* building, Helsinki, Finland. [Own material]

6

Conclusion:
Summary of Universal Accessibility
fundamentals

The objective of this dissertation was not to find a new term to express the idea of accessibility, meaning architecture designed for everyone, regardless of the physical strengths or intellectual abilities of the inhabitants. Instead, it intended to develop a new approach towards the design of accessible built environments, so that the results are equalitarian, inclusive, appealing, and sustainable for all users. However, we need to call it by one name or another, thus *universal accessibility* has been chosen as the best term referring to this understanding.

After this investigation, one could easily conclude that chaos is present within the terminology of this field, finding an evolution of terms ending in different names referring to very similar concepts. The variety is vast, from *barrier-free design*, *wheelchair-friendly design*, *universal design*, *inclusive design*, *design for all*, to *human-centred design*, among others. Despite their slightly different appreciations, all of them refer to accessible design that is respectful to all. Nevertheless, a common, comprehensible name for all cultures and understandings is necessary to continue with the dissertation at issue, and *universal accessibility* is believed to achieve this goal.

‘Universal’ because it has the strongest movement in the USA and is also used in other Asiatic countries such as Japan, Korea and India. It refers to all members of the whole; it concerns all. ‘Accessibility’ because it provides the foundational idea: to give access. Although in some parts of the world it is rejected when merely understood as providing specific access to disabled users, it is evolving in terms of providing access to all, primarily in the European context but also notably worldwide. Thus, ‘universal accessibility’ is the perfect combination to make this idea clear in the same way that ‘universal healthcare’, ‘universal education’ or ‘universal suffrage’ is understood. In fact, in Spanish speaking countries of South America, ‘*accesibilidad universal*’ is used more and more to refer to UD / ID / DfA. This is probably because they have been influenced greatly by their neighbours from the north, who prefer the term ‘universal’; but they also have great influence on their European cousin, Spain, with whom they share their language and therefore the word ‘accessibility’.

Having cleared up this point, the next step is to provide an overall reading of the main questions concerning universal accessibility. The content is the result of all the investigation carried out throughout this dissertation: On the one hand, there are the causes of failure of accessible design unravelled after the analysis of the PRM surveys, which are presented in detail in *Annex B*. On the other hand, I will also include the main questions that have arisen throughout the case study LOCUS IP, which was evaluated in chapter 4. The summary of the fundamentals will be organized in three main packages, establishing a parallelism with previous chapter 5, where the essentials and limitations of accessible design were also organized in three levels of achievements. Therefore:

- **Section 6.1** will address the aspect of **normality** that all accessible design must hold (corresponding to the level of “*essentials*” in section 5.1);
- **Section 6.2** will reflect on the **empathy-based approach** that all designer must have towards both the user and the environment (analogous to the level of “*emotional wellbeing*” in 5.2);
- **Section 6.3** will explore the **sustainable character** of accessible design environment (in accordance with the discussion regarding the “*limits*” of *accessible design* argued in 5.3)

6.1 Accessibility = Normality

The first and most basic fundamental is that accessibility must be embraced and adopted in the most natural way. Nowadays, we make a distinction between design and accessible design, but such a reference should disappear because all architecture must be accessible to all its users. The reason for still referring to the concept as ‘accessible architecture’ is that, regrettably, there are still many examples of inaccessible architecture. But this situation, little by little, is being amended, and we can forecast the time when any special reference to ‘accessibility’ will fall into oblivion (especially when talking about new architecture). In the same manner that, for instance, campaigns for safe driving insistently reminded people to fasten their seat belts, but this is no longer so necessary because people are already conscious of this.

In fact, accessibility in new architecture is practically a given these days, but this is not so in the existing built environment. This is the case because modifying heritage causes much hesitation, which provokes controversy, as was argued at length in the case study LOCUS IP. The conclusion of this dissertation is that accessibility must be naturally embraced as a new contemporary layer that cohabits with earlier ones. This is simply because good accessible interventions mean a better life for all inhabitants and it would be senseless not to do so. In contrast, detractors of accessibility who are in favour of fully preserving heritage usually disapprove of evident alterations to the environment. Nonetheless, there have been generally no complaints about any of those situations in which accessibility has been implemented discretely. Proof of this lies, for instance, in the many city centres that have been repaved with flagstones, where choosing a suitable and model according to the surroundings made the environment accessible. Furthermore, as also proposed by some LOCUS students, these accessible flagstones sometimes occupy only a part of the pavement and not the whole area. However, we should note that, as can be seen in Fig.51 below, people tend to concentrate in these accessible paved areas because they are safer and more comfortable to use.

Figure 51: Example of accessible repaving in historic city centres



Source: (right) Pavia, Italy; (left) Stockholm, Sweden [Own material]

What is important is to not lose the charm and identity of the place, and for that special attention must be paid to signage as well. As cities are not 100% accessible, there is a general tendency to indicate

accessible areas, often with excessive indications using the customary (but not inclusive) wheelchair symbol. This overstatement of accessibility can generate the opposite effect of what is desired: since people do not identify themselves with the accessible signage and being disabled, they easily reject it. Indeed, the issue of signage has been considered controversial in recent times, with several users and academics who argue about its appropriateness:

The *International Symbol of Access* (hereafter ISA), introduced worldwide more than 40 years ago and soon reinforced by the UN, is the official symbol of accessibility, and it is commonly known as the *Wheelchair Symbol*, since it is represented by a person seated in a wheelchair. However, many people have objected to this symbol. These objections highlight the criticism that accessibility not only aims toward wheelchair users, but is intended for many other situations as well. The wheelchair symbol does not represent everybody, for example, people with visual or auditory impairments. For this reason, several initiatives for designing new symbols have been set into motion, especially in the case of business and public services, where providing accurate and detailed information is essential for the activity at issue.

Likewise, it is also worthwhile to point out how this accessibility symbol has evolved in other fields, such as in technology and computer operating systems: in such a context, the defects of representing accessibility by a person seated in a wheelchair are magnified, since not being able to walk has little to do with not being able to operate a computer or similar devices. On the contrary, the most frequent groups that require computer accessibility are people with hearing and vision problems. Hence, companies such as Microsoft or Apple have developed their own signage to communicate the accessibility options of their computer programs, as the next Fig.52 illustrates. What is important to note here is that any one of the current symbols fails to represent a particular group of users (in this case, it would be people with sensory impairments). In contrast, the pictogram chosen is the most inclusive possible, whether it is represented by a kind of a wheel (Microsoft's *Ease of Access* icon; image on the left below) or by a pictogram looking like Leonardo da Vinci's Vitruvian Man (Apple's *Universal Access* icon; image on the right below).

Figure 52: Accessible signage used in computer systems: (from left to right) Microsoft's *Ease of Access* icon; Apple's *Universal Access* icon



Source: (from left to right): Microsoft's Windows; Apple's Mac OS

Nevertheless, the fact is that accessibility in the built environment is often indicated only by a wheelchair symbol, which, aside from not being inclusive, is also rejected because the figure is represented as static, creating the impression that people in wheelchairs are dependent and need to be pushed at all times. For this reason, alternative signage has been developed as well. Especially noteworthy in these efforts is the *Accessible Icon Project* (AIP hereafter) [AIP: online (a)], created with the purpose of transforming the old ISA into an "active, abled, engaged, ready-for-action, determined, and motivated" image. The AIP symbol is still represented by a person seated in a wheelchair, but the static and passive arms and legs that are drawn like mechanical parts in the ISA (see left image of Fig.53 below) are transformed into an active posture, with the elbows raised as if the person were ready to autonomously move (see middle image of Fig.53 below).

Although it is also important to activate the idea that PwD “can be active and engaged in their lived environment” as the AIP symbol aims, the fact is that this icon still falls into the error of symbolizing accessibility by only representing a particular group of people, wheelchair users, who are indeed a small percentage of the disabled community. Thus, the negative connotations of labelling disability are still present. In contrast, the symbol of universal design copyrighted by Beth Tauke, member of the IDEa Center, is worth addressing: the symbol is represented by “an equal sign superimposed on a blue and green representation of the globe” (see right image of Fig.53 below), and it “is designed for use as a multisensory symbol to identify universal design products, facilities, and services”. [Steinfeld and Maisel, 2012: loc.2508].

Figure 53: Examples of accessible signage: (from left to right) International Symbol of Access (1969); Accessible Icon



Project (2012); Symbol for Universal Design (2010)

Source: (from left to right): [Wikimedia Commons: ISA]; [AIP: online (b)]; [UD e-World: online]

It is true that better communicability of accessibility is advisable for a broader understanding that it is not about the design for the disabled, but a design that benefits everyone equally in the short and/or long term. Unfortunately, this is not comprehended as such nowadays and accessibility is often linked merely to barrier-free design for wheelchair users. In the opinion of Steinfeld and Maisel, it is necessary to go beyond improving the signage of built environments designed for all and enhance its diffusion through media coverage as well, especially through television, since it is an excellent means for communicating different realities to the greater public than other customary media. “If there was a successful sitcom about an architect who practices universal design, the take-off point might come much sooner” [Steinfeld and Maisel, 2012: loc.2176]. In other words, accessibility would be more naturally accepted and embraced as a contemporary reality.

6.1.1 Unnoticed accessibility

What remains clear is that accessibility must be provided in a normal way, without over-emphasizing its signage, and people will naturally benefit from it.

Good examples are the wooden paths built on beaches which are highly used by everybody to avoid walking over the burning sand (see Fig.54 next). In other words, although beach wooden paths are mainly built to provide wheelchair access, many people use them simply because they are more comfortable for accessing the beach. Proof of this lies in looking at the many people that tend to gravitate around this area. Furthermore, complementary installations like showers are often linked to wooden paths; thus, on the way out, most people stop there. In some cases, a chair with none or only one arm is installed under the shower, so that a wheelchair user can also take a shower before leaving the beach. Note that chairs in showers are not only beneficial to wheelchair users but to many other people as well and in different ways, such as elderly or fatigued people who sit on them, other people who prop up on the chair to clean their feet, or children who stand up on the chair while they are assisted by their parents with the shower.

Figure 54: Wooden paths for access in beaches



Source: (left) Barcelona, Spain; (right) Ibiza, Spain [Own material]

Many other examples of designs initially aimed for the disabled but that are highly beneficial and used by everybody can be found. For instance, this is similarly the case with lifts. Just remember the several complaints that were recorded during the PRM surveys about lifts being continually busy and wheelchair users having to wait to find a spot for them. Aside from notions of civic education, which are out of the scope of this dissertation, this issue also relates to the fact that people naturally tend toward an easy life, toward what requires less effort and what requires less repetitive and excessive actions. Thus, it is frequent to find long lines in lifts –especially if the number and/or size have not been correctly estimated– instead of opting for a long, tiring climb up the stairs. And that is also why several businesses opt for indicating the lift by specifying who has preference to use it (see left image of Fig.55 below). As similarly happens in the case of accessible restrooms, where signage that is alternative to the wheelchair symbol is often found (see right image of Fig.55 below). Although, as previously explained, it would be better to call these bigger accessible units ‘family restrooms’ and indicate them accordingly, since not only PRM benefit from their use but many others as well.

Figure 55: Example of alternative accessible signage: (left) lift; (right) restroom

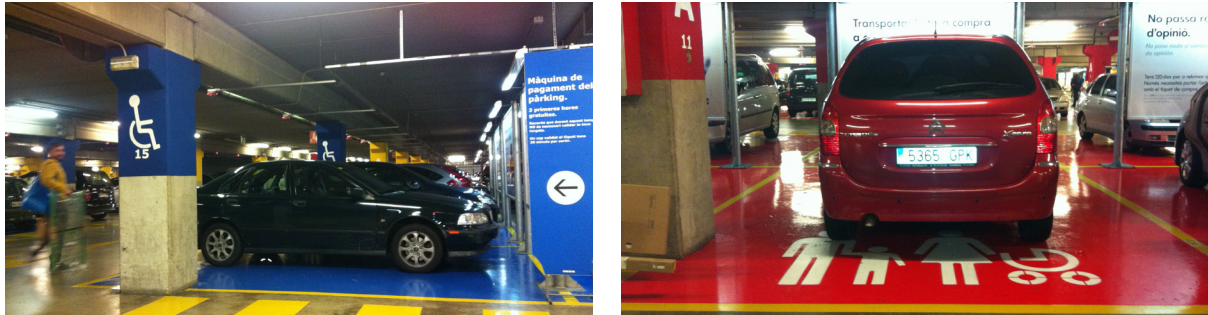


Source: (left) Barcelona, Spain; (right) London, UK [Own material]

Likewise, the value of finding a place to park close to the destination point and that is spacious enough to easily manoeuvre is not necessary only for PRM, but is also extremely comfortable for everyone. For this reason, many businesses are providing convenient parking for other groups, such as IKEA, who reserves spots close to the entrance not only for the disabled but for families also (see Fig.56 next). This is the same idea as that of the ‘family restrooms’ signage. Nevertheless, it needs to be noted that both issues can be very controversial: Having a proper spot to park your car is in high demand, and if too many spots are reserved but unoccupied, it generates a reaction of discontent of the able-bodied society; on the other hand, if they do not properly indicate preference to users with special needs, it is highly probable that somebody with mobility problems won’t find a proper spot to park and will have to abandon his/her errand. This situation is very similar with restrooms in very busy places.

If disabled people are the only ones entitled to use them, but half of the time they are empty, the able-bodied community can get upset. Yet, if they are not indicated properly, people in need may have to wait a long time to use them. And they will probably find it too dirty as well. Again, this matter is more related with the importance of civic education; and this goes beyond the scope of this dissertation.

Figure 56: Example of IKEA parking signage



Source: Barcelona, Spain [Own material]

To sum up, although accessibility emerged as a response to the needs of PwD, it is clear that it contributes on a broader scale, since practically everyone benefits from accessible designs. This only happens, though, if accessible designs are truly designed for all and not specifically as a secondary solution for a minority. In other words, we must avoid designs specifically and exclusively ‘for the disabled’, e.g., we should avoid installing lifting platforms or stair-lifts for wheelchair users, and always install instead a regular lift for everyone, whenever space allows. One could reason that the economic factor is also important for making such a decision between a lifting platform and a regular lift, since the former is cheaper than the latter because it requires less machinery and installation space.

Nevertheless, in contrast to expectations and as already reasoned previously, it turns out that accessible solutions have more benefits than costs, in economic and social terms. In the particular case of lifting platforms for wheelchair users, an almost unavoidable vicious circle is generated: the device often does not work because it is rarely used, and it is rarely used because it frequently does not function. If regular lifts that everyone is keen to use were installed instead of a lifting platform or a stair-lift (which are products clearly aimed at the disabled and thus carry a stigma), their use and maintenance would undoubtedly improve. To illustrate this fact, Fig.57 is provided below: a lifting platform has been installed to access the *Wellcome Collection* in London, UK as an alternative to the entrance stairs. Aside from the fact that the device is clearly indicated for wheelchair users, it is also extremely slow; thus, nobody else uses it. Even parents with children decide to arduously carry the pushchair up the stairs rather than use the ultra-slow lift while everybody looks at them.

Figure 57: Lifting platform for wheelchair users



Source: *Wellcome Collection*, London, UK [Own material]

It is fundamental to communicate this knowledge to students and future architects, who generally take for granted that these devices are regulatory and therefore good enough. What is more, they should be forbidden in new constructions and only be permitted in existing built environments where any other better solution is shown to be unfeasible. In contrast, everyone easily uses and freely moves in the built environment when an accessible solution for all is properly designed and integrated within the built environment, without segregational connotations such as signage for the disabled.

To illustrate this statement, next Fig.58 is provided with photographs that I spontaneously recorded when I was about to cross Foster's Millennium Bridge from St. Paul's Cathedral towards the Tate Modern in London, UK. I was going down from St. Paul's Cathedral and heading toward the footbridge when I suddenly realized that everyone was in my way: people were using the ramp instead of the stairs. I am quite used to racing down ramps, as they are usually very long and lonely. On this occasion, however, the ramp was crowded by people conversing nonchalantly, and I was simply one more of them. That certainly caught my attention immediately: the ramp is merely placed in the right and most logical position; therefore, everyone uses it, just because it is easier. That simple.

Figure 58: Crowded ramp in contrast with slightly used stairs



Source: Peter's Hill, London, UK [Own material]

In short, we must move towards unnoticed accessibility; i.e., designs that are accessible but do not aim for the disabled. What is more, this should be the target of all design. To provide one more example, the roll-in shower that is customary in Finnish housing (already described in *Annex B. PRM surveys*) is another great solution embracing 'unnoticed accessibility', because it is the normal solution found in most houses and, at the same time, is an accessible design. This point also relates to the need for accessible product normalization. Many elements form part of the built environment, such as: tables, doors, chairs, fountains, washbasins, etc. If these were to fulfil accessibility requirements as if they were considered 'normal' and designed aesthetically and affordably, a great step towards inclusive environments would be achieved.

6.2 Accessibility = Empathic-based approach

The second fundamental to concentrate on is the need of an empathic attitude towards design. Architecture cannot be conceived as pure geometric and formalistic concepts, but as inhabited places where users move, have wills and needs. Understanding this requires a genuine empathic attitude and humanistic values.

This kind of understanding has been largely defended by many architecture theorists, perfectly expressed by Aulis Blomstedt [in Pallasmaa, 2001: 216] already in the 1960s: "The ability to fantasise

space and form is not the most important aspect of an architect's talent, but the ability to imagine the human condition". In contrast, in the realm of accessibility, the built environment's power over the user's experience is not much discussed. Instead, concerns are dominated by dimensional aspects, usability and safety. While it is true that these concerns are completely essential –they are the basic needs defined in the *Steps towards Universal Accessibility*, in Annex A– they are not the only ones: accessibility must also address more existential needs involving how we feel in such accessible designs. To do this, empathy is the key factor.

This is so because designing for all requires a fundamental understanding of diversity. Thus, an empathic capacity is essential for being able to embrace the differences of human beings, to comprehend how others might be different from oneself, and also to find those qualities that are equally useful and pleasant to all. That is also why the cultural aspect within design must be considered, as particularly noted by the *Universal Design India Principles*. This is so because accessibility cannot be understood as a golden rule that can be applied in all cases alike, in the same way that architecture should not be approached as a globalized issue, which is so much like the wholesale conception that multinational companies regrettably often have. On the contrary, architecture should be put into context and provide answers to specific local needs.

Franck and Lepori [2007: 61] illustrate this fact when describing how the typical open plan kitchen, often used in modern architecture, has not properly worked for Israeli Orthodox Jewish families, since their religious beliefs prohibit women from seeing the men when they are in the living room. Thus, the result has been the introduction of curtains or something similar to avoid the visual connection between the living room and the kitchen. This example also refers to the need of retrieving appropriate feedback from the final users, since it is not only about applying standardized solutions but it also indirectly means making decisions on their behalf. Hence, empathy-based design also requires feedback from the final users, whether through direct participation in the design process or by other indirect means such as questionnaires. The goal is to achieve real knowledge in order to break generalized assumptions. Indeed, in the field of accessibility and disability, there are many preconceived ideas and prejudices that condition and restrict accessible solutions. The traditional role of "designers know best" [Strickfaden and Devlieger, 2011: 211] must be defeated; several examples prove that disabled users do not particularly find some accessible solutions useful, and they ultimately do not use the aids offered.

Consequently, a greater implication of target users is necessary in all designs, especially in the case of the accessible architectural design being discussed, since it is doubtful that designers will comprehend either the diversity of human requirements or possibly even the appropriateness of regulations. As seen in *Annex B. PRM surveys*, complaints about the lack of accessibility in certain historic public buildings have been repeatedly noted, which relates to the need of finding a better balance between heritage and accessibility. Conflicts of interest have been discussed thoroughly in the study case LOCUS IP, in Section 4.3.1. *On heritage and accessibility*, but only in the specific scenario of urban heritage. Problems in the regulations are evident, and therefore there is a need on many occasions to be less strict and have more liberty in designing solutions for accessibility.

This becomes evident in particular situations where the professionals stick rigidly to standards, even though the solution can be insultingly senseless, as happened in Dunbartonshire, UK. As it can be seen in Fig.59, a 10-level winding ramp made of steel was installed by the city council to provide wheelchair access to the home of a disabled girl. Although it is now easier for the parents to transport their daughter, they cannot help but complain about this eyesore construction: "There must have been a better solution. The council could have gone about the whole project in a more sensible way". Hence, it is clear in this example that building regulations are too strict and are rigidly approached, often with a

complete lack of empathy. The ramp cost about £40,000, and one cannot help but ask if there wasn't any other better solution, maybe even a cheaper one, but more importantly, a solution that could improve the little girl's quality of life not only in terms of practicality, but also in terms of psychological wellness.

Figure 59: 'A ramp with 10 levels installed by West Dunbartonshire council at the home in Duntocher, Clydebank so wheelchair user Katie Lally, seven, can access her home.'



Source: ["10-level steel wheelchair ramp dumbfounds Dunbartonshire", 2014]

Hence, an empathic approach towards regulations is also necessary. It is true that standards can hardly regulate aesthetics and emotional parameters, but this is indeed a very important aspect of design. Standards are necessary, because if accessibility is not demanded by law, we run the risk that unconcerned professionals dispense with design-for-all parameters. However, the risk of excessive ruling must also be recognized, because the complexity of fulfilling extremely detailed rules often generates the opposite of the desired results. Steinfeld and Tauke [2002: 176] also acknowledge this fact:

"Over time, then, the complexity of the rules has increased with questionable results in terms of improving accessibility. A serious negative backlash from the building industry developed because of the arbitrary and confusing regulatory situation. In fact, the detailed rules actually prohibit innovation through universal design in many cases."

Thus, a claim for more compatibility and liberty for innovation is also denoted. Architects should be allowed to make variations and alternative decisions when needed, depending on the circumstances. This will only be feasible if architects are properly educated on the topic in a way that makes them able to find inclusive solutions that respect all human beings equally.

The fact is that architects are sometimes not aware of the needs of diversity and do not know how to interpret the accessibility standards, which instils a fear of making mistakes due to their lack of adequate knowledge. So, the frequent option is to just copy-paste the solution specified by the rules. We must combat this lack of comprehension so that the diversity of special needs is truly understood. Strategies are needed for user-centred design, participatory design, and co-design, and many have demanded them already. There are already several real cases where these have been put into practice with outstanding results. Disabled users' implications must be pursued at all levels, but most importantly in the educational context, where the principles for future practice are based.

Steinfeld and Maisel [2012: loc.2621] similarly assert that, in order "[t]o reach professionals, professional education and the development of communities of practice, especially among educators, is a priority." Harrison and Parker [2002: 340] agree, but go further in noting that:

"In fact, it may be the teachers who are less able to make the shift in mindset than the students. Often the first reaction to being confronted with the question of access is to think of ramps as the first answer, rather than the 'level-thinking' approach, which reconsiders the fundamental organisation of floor levels and vertical circulation from the outset. From experience, a reasonable proportion of young minds in Schools of Architecture are willing to address social issues and matters of concern in design; **it is more that they may be misled by tutors into being made to feel that these are either irrelevant or too complex to handle.**"

Somehow this reflection refers to the fact that the attitude towards PwD is an educational issue; while it seems easier to convince young, ‘uncontaminated’ minds about the importance and suitability of inclusive design, it is not so immediate in the case of older adults who have been exposed since their childhood to more charitable beliefs, learning that PwD are people in need, for whom we must have sympathy and help. That is why the way that we communicate accessibility makes a huge difference. Rather than arousing solidarity values by using the image of somebody helping a nice young girl in a wheelchair –which develops sympathy, but not empathy– it is more preferable to concentrate on exploring design for all under the perspective of more comprehensive values and needs, such as sustainability, flexibility, and innovation; that is, a smart design that contemplates aspects of durability, affordability, attractiveness, and functionality, and which is suitable for all.

To sum up, it is not so much about specifying and detailing further the accessibility requirements, but to empathically communicate and spread the long term benefits of accessibility so that both academia and practice are persuaded. Luckily, it seems that this empathic understanding is already set into motion. For instance, the *Acuity Design* blog has recently posted their understanding of universal design through empathy [Alastair Somerville, 2014a: online]:

“However much people try to discuss design for inclusion as being about everyone, it is always measured in terms of people with impairments. It’s treated as a synonym for accessibility without the baggage of silo’d design for specific user impairments.

(...) Yet still, it barely hides the core idea of thinking about people with impairments and how to change the world to meet the needs of that minority.

I think of this in terms of direction of empathy.

The flow is from the majority of unimpaired people towards supporting the needs of the impaired minority.

What I’m interested in is reversing the direction and bringing it to a point of mutual respect and care.”

According to the blogger, there is a unidirectional understanding of accessibility as the unimpaired looking after the impaired, and empathy is the key element for turning this around. Only through a truly empathic approach towards accessibility, a genuine inclusion and social harmonization will be reached. In the words of the author, we should pursue a “harmonised design”, which “is about creating a place for social interaction - for conversation, for matching mutuality and empathy”. Thus, empathic care is what all accessible design must aim for in order to achieve veritable inclusion (see concept illustrated in the left image of next Fig.60).

Furthermore, a symbol for communicating this empathic design is also proposed by Alastair Somerville [2014b: online], since he also agrees with the fact that the ‘wheelchair symbol’ for accessibility errs in symbolizing accessibility only by representing people in a wheelchair, besides the fact that the symbol is more oriented toward representing the impairment and not the person. In contrast, he suggests using the symbol of a heart (see right image of next Fig.60), which is globally understood and graphically simple, and which is about people, empathy and care. Within the heart, probably for differentiating it from a simple drawing of love, the Chinese symbol for ‘person’ is embedded, since it is representative of all persons and does not fall into excluding some people by representing certain groups.

Figure 60: (left) ‘Harmonised Design - using empathy in Universal Design’; (right) Proposal for a symbol for Accessibility



Source: (left) [Alastair Somerville, 2014a: online]; (right) [Alastair Somerville, 2014b: online]

6.2.1 Accessibility = Enabling design

It cannot be stated strongly enough that designs must meet the user's needs in order to enable people and make them less dependent on others. Consequently, some negative prejudices about the capabilities of certain people will thus be defeated. It is important to remark again that accessibility is not understood to be the 'design for the disabled'. To communicate this idea more deeply, let us illustrate a couple of stories with the opposite example, that is, where a 'design for the disabled' makes the disabled even more disabled:

Picture a wheelchair user who has to attend an event at an old theatre with no accessible parking nearby. The first problem he encounters is finding a proper spot to park so that the car door can be opened 90° with enough space for assembling the wheelchair. Next, at the theatre's front door, he finds indicated that the accessible entrance is somewhere else, so he has to ask somebody in the street if he could kindly go find some theatre staff so that they will open the alternative entrance for him. Unfortunately, not only is the secondary access in the opposite corner of the building, but it also has a stair-lift that takes its time to work. All these unexpected setbacks mean that the protagonist of our story arrives a few minutes late, but luckily not too late; everyone is in their seat but the stage is still empty. However, all the people in the row have to stand up to allow enough space for the wheelchair user to pass. Finally, our embarrassed protagonist has arrived at his place, and everybody is giving him compassionate, silent looks. Now, let us give a real scenario to this story: the Novello Theatre in London, UK, as illustrated in Fig.61 below:

Figure 61: Novello Theatre: (left) main entrance; (right) secondary entrance for the disabled



Source: (left) [Wikimedia Commons: Colin Smith]; (right) [Own material]

Now, imagine that our protagonist is in NYC and has to catch a bus early in the morning, right at rush hour. The first thing he notices when arriving at the bus stop is a couple of people glancing at him and checking their watches with a bit of despair. When the bus arrives, he understands the reason for their discomfort; the only way to access the bus is through the rear door, where a foldable ramp is available. The problem is that, besides the fact that the ramp is quite noisy and slow, the driver has to leave his position to come and secure the wheelchair with belts and brakes. Again, everyone is looking at our protagonist. This time, the looks have a mixture of compassion and annoyance at being late, which happens again at the moment of disembarking.

Both examples denote a merciful attitude towards disabled people due to how the built environment is designed; i.e., main solutions for the majority and secondary solutions for minorities, which carry some kind of stigma. If the theatre of the first example had only one accessible main entrance, practically nobody would have noticed our protagonist and he would be just one more ordinary fellow. Likewise, if buses were designed so that an automatic ramp always unfolds at the time that the doors open, most likely the noisy beeps alerting the ramp would not be necessary; the ramp would probably not be so slow but equipped with modern and fast technology; and, more importantly, many other people would use it: pushchair users, children, elderly, people carrying luggage or other goods, etc. (The issue of the driver having to secure the wheelchair is another topic of discussion, which indeed does not happen in most cities). Indeed, if we change the definition of the target population for accessibility, the perspective changes significantly. In the words of Steinfeld and Maisel [2012: loc.1543]:

“Rather than viewing the target population as the less able, to whom we owe a charitable effort, it demonstrates that respecting everyone’s right to an environment free of unnecessary barriers facilitates the development of products and environments that work equally well for all.”

What is important to emphasize here is that the design of the built environment relates also to social justice, which cannot be forgotten. As Lawson [2006: 112] explains in his book *How Designers think*, the job of the designer has a prescriptive rather than a descriptive character, which is more typical of scientists who describe how the world is. Designers, instead, suggest how the world might be. Furthermore, they design how the world will be. It is relevant to suggest the capacity of designers –architects, engineers– to “eliminate the disability” to some extent. The Dutch architect Herman Hertzberg [1991: 174] also argues this in *Lessons for Students in Architecture*, in which he refers especially to people as the recipients of architecture. Therefore, architectural designs inevitably affect their inhabitants, in one way or another. For Hertzberg, the social component of architecture is unquestionable. Thus, the architect has a civil responsibility –which should furthermore be comprehended as a moral duty– to provide equally pleasant built environments for everyone:

“Architecture, indeed, everything that is built, cannot help playing some kind of role in the lives of the people who use it, and it is the architect’s main task, whether he likes it or not, to see to it that everything he makes is adequate for all those situations. It is not only a matter of efficacy in the sense of whether it is practical or not, but also of whether what we design is properly attuned to normal relations between people and whether or not it affirms the equality of all people.”

In conclusion, it is essential to “not see design exclusively as an issue of shaping but also as a moral, ethical, political, and technological issue” [Kennig and Ryhl, 2002: 35], always bearing in mind the goal of creating enabling environments. Quoting Steinfeld and Maisel [2012: loc.1629]: “Universal design is about searching for design strategies that have *universal* benefits.”

6.3 Accessibility = Sustainability

Finally, the last fundamental to highlight is that accessibility is tightly linked to sustainability. We must be aware of the significant ageing of the worldwide population, especially in developed countries; thus, implementing accessibility understanding in our current designs will reduce the economic burden of the upcoming ageing society of the future. Therefore, accessibility also relates more to sustainable designs.

Steinfeld and Maisel [2012] also acknowledge this fact in their book, *Universal Design: Creating Inclusive Environments*. Furthermore, they explain how “the increasing burden of the older population leads to an increased potential for political conflict between younger and older generations” [loc.1696], since the young are the ones who will support the elderly. From the authors’ point of view, applying universal design to workplaces will allow “older workers to lengthen their participation in work, increase tax revenue, and reduce their economic dependency on the rest of the population” [loc.1733]. Likewise, several other studies acknowledge the fact that the cost-benefit relationship when adapting existing built environments is always more profitable than costly in terms of economic and also social benefits. Dunn [1991: online] provides a short description of them:

“For example, a cost-benefit study undertaken by the U.S. Department of Housing and Urban Development estimated that adapting existing housing reduces the need for support services and yields benefits that amount to 13 to 22 times the levels of costs (Robinette, 1978). (...) A study by Silvia Sherwood (1981) indicated that 50 per cent of the 344 people applying to the Hebrew Rehabilitation Center for the Aged in Boston in the early 1970’s were capable of functioning in the community with appropriate supports and accessible housing. (...) Finally, Adolf Ratzka (1984) documented research in Sweden which found that 12 per cent to 30 per cent of the moves of disabled individuals to nursing homes and sheltered housing could have been avoided by accessible housing alone.”

Hence, accessibility is also a relevant matter to be approached from a political perspective, since the growing older population is so significant that it becomes a social and economic imperative, and not only a moral obligation.

On the other hand, the most frequent misconception is that accessible designs are more expensive. While this claim is often true when implementing accessibility *a posteriori* (e.g., remodelling an existing home to suppress architectural barriers), it is not necessarily true when introducing accessible parameters in the first stages of the design process. Indeed, according to the published *Study and evaluation of integrating the handicapped in HUD housing* [Battelle Memorial Institute, 1997: 102], the relation of additional construction costs when incorporating accessibility into a dwelling design prior to construction is the following:

“If approximately 10 percent of a multifamily dwelling project’s units are designed for accessibility and adaptability by the disabled, the additional cost will probably be between .25 and .5 percent of the total cost required for conventional construction.”

Therefore, the economics are only affected by less than 1% in this case. Then, by rule of three, if we were to assume 100% of the units are built for accessibility, the economics would be affected by approximately 5%. What is more, adaptability parameters –also known as ‘practicable’ or ‘ageing in place’ designs– become money savers in the future, since they are designs that can be easily adjusted to accommodate future needs over the years (e.g., prevision of a space for a future elevator, possibility of bathtub removal to easily build a roll-in shower, etc.). What is more, according to the *Accessible Housing Database and Manual* [Toran, 2000: online], adaptability is even more economically efficient than specific accessibility standards, because it allows for more flexibility and only implements accessibility when needed, depending on the specific circumstances:

“For example, accessible design standards would mandate that a builder put grab bars in the bathroom at a specific height. Adaptable design would require the builder to provide reinforced areas for potential placement of grab bars.”

Hence, adaptability signifies that, rather than building everything accessible, the possible adjustments that will be necessary in the future have been forecasted and their related expenses would be reduced to the minimum, in the case that they should be necessary.

Moreover, some cities have developed the ‘visitability’ concept in their ordinances, which advocates that all housing should have a certain minimal level of basic accessibility and adaptable features rather than insisting that a certain percentage of housing units be accessible. This is also defined as providing the “maximum feasible basic access”. In other words, visitability is normally understood as fulfilling the most essential concepts of accessibility: entrances without steps, a downstairs bathroom, sufficiently wide doorways, etc. This also encourages easy adaptability over the years. Likewise, the estimated cost of implementing visitability standards is quite low, calculated to be a maximum of \$200 extra for construction costs [Toran, 2000: online]. (Note that this study dates from 2000, and current additional costs could vary significantly).

In this regard, it is also worthwhile to address the *Three Principles of Visitability*, defined by Nasar and Evans-Cowley [2007: 35]: “1) Inclusion of basic architectural access features in a home; 2) Good basic accessibility at minimum cost; and 3) Simplicity promotes implementation”. In other words, visitability promotes social interaction, because everyone can more easily visit friends, family or neighbours. As visitability refers to including the very primary and simple aspects of accessibility (step-free entrances, sufficiently wide doorways, and practicable bathrooms), its implementation is easier, and therefore encouraged. At the same time, expenses are kept to a minimum because all the main accessible architecture features have been incorporated during the early stages of the designs’ development rather than creating retrofitted designs later, which would normally have significantly higher costs. Therefore, again, visitability is always more profitable than costly in terms of economic and also social benefits.

In a similar manner, a policy of implementing accessibility in the public realm will most likely generate greater benefits in the long term. Quoting one of Steinfeld’s and Maisel’s [2012: loc.1930] examples: “If new riders seeking to lower their transportation costs find that public transportation is pleasant and convenient, they are more likely to continue to use the service and less likely to switch back to automobiles when fuel costs decline.” This example directly refers to sustainability in terms of environmental preservation. Summing up, accessibility makes economic and sustainable sense, in both the public and private sector.

Regrettably, professionals are generally resistant to adopting accessibility in their designs because they tend to think that it is only of interest a minority of users. Therefore, its marketing becomes harder, and it furthermore supposes an increased design time and cost that is not rewarded in economic terms. [Steinfeld and Maisel, 2012: loc.2426] This unfounded belief is what needs to be eradicated in order to spread the adoption of inclusive designs. Having statistics on the real number of beneficiaries when adopting accessible designs would be very helpful to achieve this goal, because it would provide tools for turning it into an actual business decision and in turn rescuing accessibility from its background position in the market. What is more, it is a necessary step for social justice, because the affordability of accessible products is one of the main issues that must be corrected, especially when taking into account that disability and poverty are intrinsically related. This is particularly true not only in developing countries, but also in developed countries where PwD are more likely to be unemployed or work part-time. Even if they are fully employed, they may have lower incomes, despite having the same educational background as non-disabled people. [WHO and World Bank, 2011: 39]

Furthermore, aside from measuring the beneficiaries, it is highly advisable to also measure the consequences of not applying accessibility parameters in designs, since that would mean having a basis for establishing policy. This is a difficult problem to quantify because the repercussions are not as immediate as, for instance, the case of not considering sustainability. In the words of Steinfeld and Maisel [2012: loc.287]:

“The cost of not paying attention to the environment is demonstrated clearly every day all around us—more pollution, less fish, higher fuel costs, etc. The cost of not practicing universal design is not as easy to perceive right now. One has to parse through statistics and learn how to look at things from the perspective of others.”

Nevertheless, as discussed earlier, we are not truly doing anything about our exorbitant consumption of natural resources to avoid global warming, and we are similarly not truly embracing accessible design to avoid future economic and psychological costs that will be generated by unfitting designs for our future needs. This is so because it is a natural reaction to avoid unpleasant ideas, like planetary collapse or contracting a disability. Instead we should do the opposite: empower our empathic capacities to connect with our future and accept in a natural manner that natural resources are limited, just as ageing is unavoidable for human beings. If we can do this, the inevitable consequence is that we will finally act accordingly.

An empathic approach towards the design of our built environments is necessary so that all human needs, present and future, are integrated in one same framework of design. Let us call it accessible design, design for all, human-centred design, sustainable design, design for ageing in place, or design for health. Whatever name we choose, the goal of such design is to embrace collaboratively all essential concepts at once: designing environments that are affordable in both the short and long term and that are aesthetically pleasing and high-functioning. In this way, human health, safety, and wellbeing will be protected. In such a paradigm, sustainability and social justice will be within our reach, because all human beings will benefit, sooner or later, from such win-win designs.

6.3.1 Accessibility = Benefits for ALL

Accessible solutions generally mean better comfort for everyone. While some requirements are indispensable for some people with special needs, they are indeed more easily usable and functional in general terms. To provide some statistical data: “The status quo shows that accessibility has already become indispensable for every tenth citizen, necessary for around every third, but an important comfort, convenience and quality feature for every single individual.” [Loeschcke, 2011a: 109]. Let us also remember well-known examples such as kerb ramps, automatic doors, or lifts.

Nevertheless, regrettably, there is a common general misconception that accessibility matters concern only PwD directly and elderly people indirectly when they eventually contract mobility, sensory, and/or cognitive impairments. It is important to broaden this understanding, because there are indeed many other quotidian situations in which fulfilling accessibility requirements benefits the whole population. For instance, designs that are suitable for wheelchair users and/or people with cognitive impairments can be also beneficial for children, due to their reduced body shape and still ongoing cognitive development. Simultaneously, when providing safe designs for children, the parents—especially single-parent families—also turn out to be beneficiaries of such design, since their surveillance stress is reduced. Likewise, many other people benefit, for instance, from designs with shorter walking distances combined with areas to rest, or from designs that allow neutral body positions and lower forces to operate equipment. This is true not only for PwD, but also for people carrying packages, parents with

pushchairs or carrying children, pregnant women, heavy people, temporarily injured people, people with respiratory problems, or just fatigued persons, among others.

Indeed, providing easily accessible and usable environments directly benefits not only those people with special needs, but also those accompanying them, such as family members of PwD and/or small children, spouses of older people, and other caregivers like nurses or nannies. In the same manner, providing easily understandable environments with intuitive navigation and a clear perception of the space is beneficial for more than people with sensory or cognitive impairments; it is also favourable for people not familiar with the place, such as foreign visitors –especially those who do not speak the language– or people with altered perception or cognition due to alcohol or drug abuse, or medication dependency, among others.

This is a fundamental understanding that needs to be transmitted to every single person: until this comprehension is achieved, accessible design will be set aside as a concern for a minority and pushed into the background of architectural design. In order to do this, a normalization of diversity is required, which can only be attained by means of cohabiting, sharing, and embracing our different ways of living. For this reason, one of the main statements of this dissertation is that, in order to spread the importance of accessibility to architecture students and normalize diversity for achieving inclusive designs, co-participation among different groups of people must be promoted so that we can learn from each other. In particular, activities should be organized in the academic environment for able-bodied and disabled people, and the activities should be long enough or repeated a sufficient number of times in order to cultivate meaningful, empathic connections and enhance the acquisition of significant knowledge.

In addition, carrying out exercises, such as the simulation of disabilities explored in case study LOCUS IP, is considered necessary to provide a more vital experience. It can be extremely rewarding to experience one's self all the different impairments that one can encounter throughout one's life. As well, this is fundamental for comprehending the diverse population's needs and for finding possible solutions to those impediments in a more intuitive and logical way. What is more, after having experimented such feeling of being impaired, most students described it as an 'eye opener', because they discovered that certain aspects were indispensable for people with mobility and/or sensory impairments, aspects which they had never thought of before. More importantly, they realized that accessibility designs can mean architecture that is infinitely more usable and comfortable for the rest of the community.

It is true, however, that picturing ourselves as disabled is not a pleasant thought, and most people tend to avoid the idea. For this reason, it might be a wiser approach to design for our future old-selves, since everyone will more likely think about oneself as ageing nicely rather than being disabled. Nevertheless, being old means having a little disability in every sense: sight gets worse, you cannot walk so fast anymore, kneeling is hard and getting up again is even harder. Your muscle strength is not what it used to be, and you need to turn the volume up every time. That is not considered as having a disability; it is simply the normal course of life and we all will probably experience it sooner or later. As old people, we will demand the same qualities we do now: we will want an elegant design that is useful and affordable, but we will give priority to designs that are clearer, simpler and safer. In the words of Herwig [2008: 16]: "The geriatric generation of 2046 will demand both function and beauty (...) Ergonomics and good looks in one (...) We first need to overcome the barriers in our heads, then those in our environment."

What is more, if accessibility requirements –always understood as good quality design that is equally usable, aesthetic and affordable– are better for older generations, this reasoning backs up the claim that everyone, eventually, will benefit from accessible designs.

7

Epilogue

There is a general “impression that accessibility can be practiced simply by complying with accessibility codes, relegating the concept to a legal concern within the design professions and to technical specialists who are code experts.” [Steinfeld and Maisel, 2012: loc.1512] This belief must be defeated. Because, if not, accessibility will not be naturally included in the general mainstream of design, but relegated to secondary concerns that are solved further on in time when the specialists take care of them.

The question of a need for greater regulatory effort has also been discussed in the previous pages but, in short, the conclusion is that, although standards for accessibility are necessary, they are not the key for achieving genuine inclusive environments. Regulations limit to some extent innovation in design and, as previously argued, accessibility is not a golden formula that can be applied to every case. Rather to the contrary, it needs a local approach that takes into account its cultural context and local resources. Proof of the limitations of regulations lies in the many manuals on good practices, which are promoted by city councils and/or regional governments. Many believe that they are easier to use than regulations, even that they are more useful, since they are complemented with a variety of real practice examples. However, these guidelines remain voluntary and are often only available under payment. Hence, their use is not really encouraged and their real influence cannot be accurately determined.

Therefore, the numerous documents available on the topic indicate that interest in accessibility –often called UD, ID, or DfA– is growing and catching on with the general public. In addition, further concepts such as sustainability, affordability or personalization are every time more attached to the idea of designing for all. Nevertheless, it has not become mainstream thinking yet, as has been thoroughly reasoned throughout this dissertation. To reverse this situation and increase the rate of adoption of accessibility in its broadest understanding, special emphasis within university professional education programs is necessary, as has also been defended by many other academics.

Empathic design strategies are believed necessary for successfully accessible design. In fact, they have already been set into motion in Industrial Design but, unfortunately, are practically non-existent in the architectural profession. The comprehension of accessibility in architecture must go beyond the mere dimensioning of spaces; particular care towards the experience and perception of the built environment must also be pursued, and always with an empathic view. In other words, the architect must be aware of the multisensory experience of architecture, calling into play all those elements – materials, textures, temperature, light, etc– that are fundamental factors for generating comfort, pleasure and a sense of wellbeing in the built environment, i.e., everything that is fundamental for meeting higher existential needs.

A certain lack of aesthetic-empathy is evident when designing accessible places, and this is one of the main reasons why accessibility is rejected by default. Aesthetic quality is also embedded

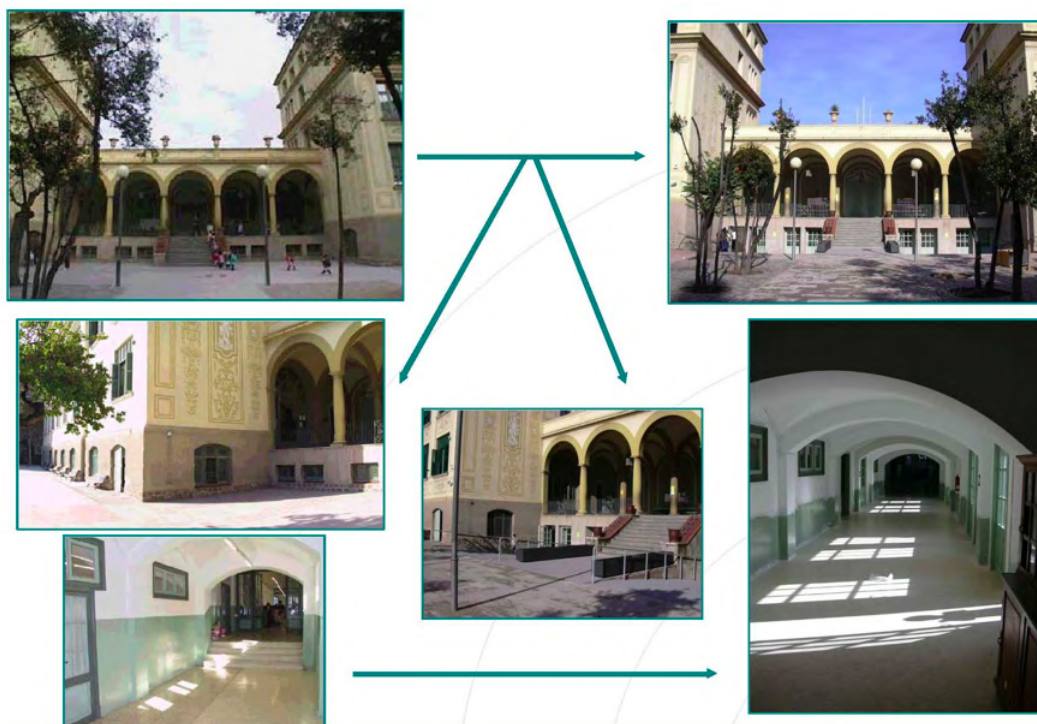
within the empathic multisensory approach since, as pointed out by Canter [2001: 52], the perception of comfort and beauty are intertwined. What is more, quoting the words of Stendhal [1822: Chapter 17, footnote]: “*Le beauté n’est que la promesse du bonheur*” (“Beauty is nothing other than the promise of happiness”).

Consequently, greater empathy is necessary in order to reach truly inclusive built environments, where everyone is satisfied, because not only are the functional or basic needs met but also the ‘supra-functional’ or existential ones, which entail a perception of a better life. We must never forget, as Aalto wisely warned after his intense experience when designing Paimio Sanatorium, that architects should always design for “man at his weakest”, i.e., they should consider the architectural experience by taking into account all the fragile physical, sensorial and psychological factors of life.

Accessibility questions do not have a standardized answer, but they have a great spectrum of possibilities that must be specifically analysed in each particular case and local context, always under an empathic approach attentive to human diversity. Only this architecture will be authentically inclusive to all, and a safe path towards it is to adequately train architects on their empathic capacities. The aim must be to attain ‘unnoticed accessibility’ through integrated universal proposals, and not by specific solutions for the disabled. The British Professor of Architecture, David Bonnett [2009: online], defines good accessibility as “not being evident, because it is not obvious”. Or, in the words of the Spanish accessibility consultant Rovira-Beleta [2010: 41], “[g]ood accessibility is that which exists, but goes unnoticed by users, with low or no cost on many occasions”.

It could be described in a very simple way: if we are able to take a picture where an accessibility solution is evident, it means that it is obvious and not integrated; therefore the problem has not been correctly solved. An accessible design should be the whole space, rather than specific areas with often dispensable orthopaedic devices where the disabled are segregated. A good example of how solutions for accessibility can go hidden and unnoticed by users is the one provided by ProAsolutions when they adapted the school of Ramon Llull in Barcelona.

Figure 62: Process of adaptation of Ramon Llull School; Barcelona (Spain)



Source: Image courtesy of Design for All Foundation

As can be seen in previous Fig.62, the access from the patio to the school was through a staircase leading directly to the first floor of the building. The ground floor functioned as a half-buried basement with no entrance and only upper windows to the exterior. The ground floor itself also had architectural barriers, with few steps at both ends of the corridor (see left images). The solution, instead of installing the customary stair-lift to provide wheelchair access, was to excavate part of the patio's ground to build a ramp leading directly to the basement floor, which in turn was also partially transformed by converting the upper windows into entrance doors and at the same time raising the level of the ground so that all the surface was at the same level. The steps at the end of the corridor were also eliminated. Thus, it was made barrier-free and was able to connect with the inner lift of the building (see right images).

This solution was probably more expensive than installing a stair-lift in the patio and a couple of add-on ramps in the basement floor. Nevertheless, it was chosen because it provides a much better solution for all its users: little kids can now easily run up the ramp towards the patio, without worrying too much about tripping and falling on the stairs. And it takes them less time. Thus, the benefits are greater and the solution is worthy. Hence, we must not forget that architecture that can be used by people with mobility and/or sensory impairments will always be more comfortable for everybody; it is not about solutions for a few, but benefits and quality of life for all. Accessible architecture is highly and widely beneficial, because designs that are equally usable by all are also more sustainable and efficient environments, which translates into a notable increase in quality. Those designs that make sense for all users always work better and generate more profit, since the maximum number of people can use them.

Indeed, when accessibility goes unnoticed it is a sign that it is well solved, integrated and equally used. Hence, the UN Convention's definition would be much improved by adding concepts about beauty, comfort and safety, as well as the haptic, ergonomic and kinaesthetic aspects. The aim is to combine the study of motor functions and anthropometric parameters to create usability and safety for all users, together with aspects of cognition and perception to promote empathic and emotional designs with the final goal of providing a sense of wellbeing. If architects and designers design in such terms, multiple economic benefits are guaranteed: having accessibility in mind a priori is synonymous with sustainability, because probable renovations and adaptations of a determined space have been planned with foresight. In turn, it can be used long-term with no need for a posteriori investments that will represent much higher expenses in the future. At the same time, offering easy, comfortable and accessible environments to clients assures their loyalty, because we cannot forget that people with special needs really value security and mental tranquillity since unpleasant surprises are out of the picture.

The reality is that accessibility requirements must be seen as business goals and opportunities, never as negative obstacles. They must always bear in mind, as Dong [2012: online] encourages in her writings, that inclusive design should be considered and explored from three perspectives: as "good design", as a "means for innovation", and as a "means of identifying design deficiencies". Furthermore, as Steinfeld and Maisel [2012: loc.2013] claim, "universal design is a process rather than an end state". Thus, we must acknowledge the importance of flexibility in design and allow for adaptability overtime. What is more, it is necessary to enlarge the understanding of accessibility with concepts of compatibility, adaptation and personalization, especially in order to protect one's identity and self-confidence, as well as to eliminate the stigma of certain assistive products, as thoroughly reasoned in Jacobson's [2014] dissertation *Personalised assistive products: Managing Stigma and Expressing the Self*.

However, establishing limits to accessibility is also necessary, because we must accept that not everything can be made accessible to all. For instance, the accessibility of historic monuments, as earlier discussed in Section 4.3.1 *On heritage and accessibility*, presents its own limits: While we should

ensure its access as far as possible to all people, we cannot pretend to accomplish all requirements of modern constructions in such heritage surroundings. For example, the current standards for vertical communications or passing widths may not always be feasible. This is particularly so in the case of memorial places, where the main aim of the building is to preserve it as it was, as exactly as possible, since it serves more as an architectural museum in which we can learn about history and the past rather than some other purpose.

This can be easily exemplified by observing the *Castelo de São Jorge*, an old medieval citadel in the city of Lisbon (Portugal). Originally built in the mid-11th century by the Moors, the defensive site went under several transformations over the centuries. It was not until 1938-40, when the last restoration was conducted, that the castle and the restored ruins of the former Royal Palace and part of the neighbourhood for the elite were opened to the public as a National Monument. The archaeological site has been adapted as far as possible to PRM by introducing subtle ramps that are integrated into the surroundings (see left image in Fig.63 below). However, the impossibility remains of reaching the top of the defensive walls and towers, as there are still stairs to climb (see right image in Fig.63 below).

Figure 63: *Castelo de São Jorge*



Source: Lisboa, Portugal [Own material]

It is understandable, somehow, that the watchtowers have not been made accessible, since doing so could have snuffed out the essence of the construction: a defensive wall is made precisely to be as inaccessible as possible in order to defend against enemies. In contrast, the cafeteria and the museum displaying the archaeological findings during the restoration can be visited with minor difficulties. Hence, those areas that serve for new functions must be accessible while this is not necessarily so for the architectural parts that become exhibitions themselves.

A similar understanding can be described when addressing the accessibility of the natural world. To begin, defining the limits of accessibility is necessary for respecting the Earth, and we could say that only a part of nature must be accessible: natural environments that have human intervention. This includes natural places that, although not substantially altered by human presence, are generally enjoyed by people, such as beaches or metropolitan forests. In these cases, a partial accessibility covering the main areas of interest should be ensured, like the basic paths of National Parks, for instance. The rest, wild nature (even those destinations for adventurers), cannot be modified to be barrier-free. This is for the same reason as before, because it would lose its essence.

Not only is it advisable to establish limits to accessibility, but defining levels of accessibility is highly desirable as well (as described earlier in 5.3 *Limits*). It is especially recommended in the case of dealing with already built environments instead of new constructions, where it is often not

possible to fully complete the demanding requirements. In such scenarios, the concept of ‘practicable’ is fundamental, which must be understood as implementing accessibility “as far as possible”. For instance, an accessible manoeuvring zone for a wheelchair user is standardly measured in a 1.50m diameter turning area, but a 1.20m diameter is generally acknowledged as a ‘practicable turning area’. This means that in a 1.50m diameter, all wheelchair users –especially those using large, electric wheelchairs– can manoeuvre; while in a 1.20m diameter, not everyone will be able to turn around easily, but many users with not-so-large wheelchairs will still be able to use the space. That means that it won’t be accessible for 100% of the wheelchair-user population, but it will be for at least some of them. Whether it is 70%, 50% or 20%, the percentage we are talking about is always more than 0% of wheelchair users. (Note that these dimensions may slightly vary, depending on the regulations of each country.)

This observation is worth mentioning because, in many regulations, a footnote is appended, saying something like “only applicable if reasonable”, referring to the “reasonable accommodation” definition provided by the United Nations *Convention on the Rights of Persons with Disabilities*:

“‘Reasonable accommodation’ means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms.” [UN-CRPD, 2006: article 2]

What is considered to be a “disproportionate or undue burden” would be the following question. For instance, the 2003 Spanish *Ley de Igualdad de Oportunidades, No Discriminación y Accesibilidad Universal* – LIONDAU (‘Law on Equality of Opportunities, Non-discrimination and Universal Accessibility’), provides its own definition of “disproportionate burden” by specifying the following:

“To determine whether a burden is proportional or not, one must take into consideration the costs of the measure, the discriminatory effects on persons with disabilities in failing to adopt the measure, the structure and characteristics of the person, the entity or organization that must implement it and the possibility of obtaining official financing or other assistance.” [LIONDAU, 2003: article 7] (Author’s translation).

Therefore, understanding of a ‘disproportionate burden’ remains quite uncertain. Regrettably, the final result is that implementing accessibility in existing buildings is too often considered as ‘disproportionate burden’. In contrast, if we do not exclusively consider ‘accessible’ requirements but instead accept ‘practicable’ ones, this ‘disproportionate burden’ might become more feasible.

It is worth noting that to some extent this ‘practicability’ concept relates to the ‘adaptability’ and ‘visitability’ concepts described earlier (see 6.3 *Accessibility = Sustainability*). We should remember that adaptability refers to a built environment that can be easily modified so that it becomes accessible with minimum costs; i.e., PwD can live in the place after implementing some adaptations, which have been forecasted in advance. Meanwhile, visitability refers to having access to the primary spaces of the building and normally includes no less than accessible bathroom. In other words, PwD have the possibility of entering a place, but not necessarily of living in it. In the words of D’Innocenzo and Morini [2011: 15.2], adaptability can be understood as “deferred accessibility”, and visitability as “partial accessibility”. Both ‘adaptability’ and ‘visitability’ concepts are oriented more towards new edifications rather than already built environments. However, they also include the ‘practicable’ idea to some extent, because providing deferred and/or partial accessibility is no other than ensuring the minimum requirements to allow acceptable (practicable) accessibility, always forecasting possible changes that will be needed in the future, such as the installation of assistive devices in the form of space prevision for a lift in every floor, reinforcement of certain areas in walls to install grab bars, etc.

Luckily, there are additional national building codes that every time address more and more the basic access features that should be incorporated into design. Some of these are mandatory, others

voluntary [Maisel, 2011: 25.4]. In contrast, the concept of practicable (accepting different levels of accessibility if necessary) is unfortunately disappearing in some countries. Such is the case with the updated Spanish regulation of 2010 *Código Técnico de la Edificación* – CTE (‘Technical Building Code’). The CTE amendment eliminates the concept of ‘practicable’ that was allowed in some regional regulations (such as the Catalan *Codi d’Accessibilitat de Catalunya*, earlier mentioned), labelling it as “second-rate accessibility”. Such modification has been made under the thinking of providing only one single and compulsory ‘accessible route’ that is equal for everybody and which tries to avoid any connotations of discrimination, as published in an official CTE press release [CTE: online]. Although this is a tricky subject, I believe that it generates more disadvantages than benefits because, as has been reasoned above, the consequence may be to find more ‘disproportionate burdens’ than necessary; thus, often the result translates into having less accessibility. With the aim of not discriminating any user at all, the conflicting result is that they are discriminating against a greater number of people. One last note: highly impaired users who absolutely require the maximum standards for accessibility are often also accompanied by somebody assisting them.

The idea is that we should accept that we are all able in different ways, even those in the disabled population. This fact relates, again, to the question of signage: when a place is accessible, it is indicated with the standard regulatory ‘accessible sign’ that is represented by a wheelchair user. For starters, it is not representing the diversity of disabilities at all. Furthermore, it labels spaces in an inconvenient manner, restricting the spaces in some ways only to certain users. If, instead of labelling the space according to which users are entitled to use it (which, by the way, is very hard to determine), we describe the distinctive features of the spaces, the outcomes would be much greater. For example, an accessible toilet or a disabled parking spot are not only usable by people in wheelchairs, but families can find them very convenient as well, since they offer a larger space that is very useful when going around with a baby pushchair. This is also a tricky subject because, for instance, a minimum number of disabled spots must be guaranteed in a parking area, and if we do not indicate them conveniently, the unwanted result could be that all the accessible places become occupied by others while PRM find no option to park. Nevertheless, admitting that further thought must be dedicated to the subject, it is worth noting that if we communicate the characteristics of the space rather than label the user, the result would be more inclusive: bigger bathroom/parking spots for single parents with kids, someone travelling with luggage, wheelchair users, etc.

Either way, what is important is that “the incorporation of universal design attributes makes projects more sustainable, more durable, and more valuable.” [Steinfeld and Maisel, 2012: loc.238] This is so because accessible environments, if designed conveniently without disability connotations, provide more comfortable and pleasant use. Thus, they are preferred by the population and, therefore, are used more frequently and over more time. Rasmussen [1964: 12] defended that “one of the proofs of good architecture is that it being utilized as the architect had planned”; the same applies to accessible architecture: if everyone uses it, and not only PwD, it is proof that it has been well designed. Or, as explained in *Designing for People* [Dreyfuss, 1955: 24], a book dedicated to the discipline of industrial design:

“If the point of contact between the product and people becomes a point of friction, then the designer has failed. If, on the other hand, people are made safer, more comfortable, more desirous to purchase, more efficient –or just plain happier– by contact with the product, then the designer has succeeded.”

Again, similar reasoning is applicable: when an accessible solution becomes a point of friction with the user, then the design has failed and it is merely a ‘design for the disabled’, because nobody other

than those with no feasible alternative will use it. In contrast, if everyone is happily using the design, it means that the designer has succeeded in creating an inclusive environment.

To sum up and conclude: an empathic connection with people and life is fundamental for an architect. Empathic architecture is that which places the user at the centre of design while paying attention to and integrating all the previous concepts described: movement, hapticity, light, enclosure, etc. It is about architecture designed for the human body, its movements and its intentions.

“When architecture is designed from the body, from its needs, desires, and aspirations, when it completes and extends the body in the best ways possible, it creates a series of ‘paths’ for the body to follow easily and comfortably that enhance our experience of daily routines, and that may bring about change in our live.” [Franck and Lepori, 2000: 51]

I might add that not only change will come about, but, more precisely, a chance in our lives to feel good about ourselves, to feel capable, to feel free.

For empathic architecture, we need time. However, professional practice unfortunately does not often permit that; it is ruled by imperatives of cost and speed. For this reason, it is extremely fundamental to spend time during the educational process to strengthen students’ capacity for empathy. Students are the future architects who must develop successfully empathic connections with the end users. A great step towards empathic design is in the recognition and embrace of others’ abilities, remembering that “wherever possible acting out and doing with will support deeper connections resulting in empathic understanding and elevated design outcomes.” [Strickfaden and Devlieger, 2011: 215-216]. Quoting again Benjamin Franklin: “Involve me and I learn”; it is basic that architectural students finish their studies by having experimented themselves the empathic design processes which, in order to be qualitative, must be carried out in a way that enhances meaningful relationships among the design studio participants. Cohabiting, sharing, friendship: these are all important factors that determine the success of developing empathy, that is, feeling ownership for the outcomes of the design decisions.

The fact is that impairment simulation exercises have helped students realize how architectural barriers greatly affect some people and what they really signify. And they have discovered that, by making them disappear, they have made a great step towards eliminating the negative connotations of disability and the feeling of being handicapped. Therefore, thanks to this methodology that allows empathic connections with disability, a change of values has been also noticed: students have connected with their social duty as architects, and have transformed accessibility into their own goal in design. As architects, we should feel partly responsible for generating the feeling of disability, but we also have it in our power to encourage possibility of eliminating discrimination against different capacities, against merely being different. We must not forget that people with differing capabilities have the same right to participate actively in our society.

Values of equity, rightness, sustainability, social responsibility: these are all strengthened through this approach. When one becomes truly conscious that he/she won’t always be fully autonomous, that relying on the reciprocal goodness of others is essential, only then can a sense of justice flourish. Designs must be equally attentive to all. As the old story says: ‘One father, in his will, left his older son with the responsibility of splitting his inheritance into two, while the younger son had to choose which part belonged to whom.’ In the same way that the older brother distributed the properties as equally as possible, architects must design as if it were for them. This is perhaps obvious and unquestioned in general design: architects generally design buildings that please themselves. What this thesis insists here is that they have to do the same when designing ‘for the disabled’. What is more, they must eliminate designing for the disabled and, instead, design always for all. In the same way that it did not matter how the younger brother assigned each part of the inheritance because it was comparably equal,

it must not matter whether the design is for an able-bodied or disabled person, because in the end, we will all be the same.

In fact, we must make an effort to accept ageing and its consequent accessibility needs. The intelligent approach is to question ourselves about how we can design built environments that are not only required, but desired by our future selves. As Evans [2011: 247] explains, we can engage with the future within the design process: as designers, we shape the future by actively creating it; our visions of the future must consider both flexibility and adaptability as essential elements, and what we envisage for the future will become a reality. In such a future, we will have reached genuinely inclusive architecture, where the diversity of needs is understood as one's own, thanks to an empathic approach towards it.

We must encourage our imaginations to envision inspiring future selves.

"The real measure of the qualities of a city is whether
one can imagine falling in love in it."

[Pallasmaa, 2013: 75]

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ANNEX A

Principles For Accessibility (For All) Review

A.1 Introduction

As seen in the second chapter of this PhD, where the state of the art of accessibility has been described, there is a notable level of anarchy on the subject of accessibility – or its equivalent (UD, ID, DfA, etc.), depending on its geographical origins. We can find several types of organisations and institutions around the globe that are concerned with the topic and work towards accessibility. Some of them are:

- University centres:

Center for Universal Design (CUD), based at the College of Design at North Carolina State University (NCSU) in Raleigh (USA) since 1989, as a clear pioneer on the topic. It is focused on improving the built environment and related products, and the research team incorporates varied sensibilities: architecture, industrial design, ergonomics, psychology or landscape architecture.

Center for Inclusive Design and Environmental Access (IDeA Center), based at the University at Buffalo (USA) since 1984. It is also a leading centre for research and development in UD in North America. The research team includes people from different backgrounds such as architecture, industrial design and environmental psychology; also working in collaboration with the *Center for Assistive Technology at the Department of Rehabilitation Sciences*.

OPENSspace, is an international research centre for inclusive access to outdoors environments, in association with the University of Edinburgh and Heriot-Watt University (UK).

Human-centred Design Institute (HCDI), from Brunel University (UK), leads different lines of research from a vast approach to design products, services and systems to be physically, perceptually, cognitively and emotionally intuitive. HCDI brings together a group of experts from four Brunel University Schools, highlighting the ‘Inclusive Design’ research line.

Helen Hamlyn Centre (HHC), at the Royal College of Art (RCA) in London (UK), provides a focus for people-centred design and socially inclusive approach to design. HHC is the successor to *DesignAge* which was a very active research unit at the RCA between 1991 and 1998. *DesignAge* triggered the establishment of an international *Design for Ageing Network (DAN)* in 1994. Since early 2004, it was superseded by the Include Network, with a broader perspective based on advancing the concept of inclusive design; that is, the whole population, all ages and abilities.

- Government advisory organisations:

Commission for Architecture and the Built Environment (CABE) established in 1999 was originally an executive non-departmental public body of the UK government. On 2011 it merged into a charity named *Design Council*.

Handisam - The Swedish Agency for Disability Policy Coordination, is a government agency in Sweden under the Ministry of Health and Social Affairs. It was established in 2006 to accelerate the implementation of the ongoing national plan of disability policy.

Centre for Excellence in Universal Design (CEUD) established by the *National Disability Authority (NDA)*, based in Dublin (Ireland), since 2007 under the Disability Act 2005.

Delta Centre is the *National Resource Centre for Participation and Accessibility* in Norway. It comes under the authority of the Norwegian Directorate for Children, Youth and Family Affairs.

- Non-governmental or non-profit organisations (NGO or NPO):

Centre for Accessible Environments (CAE), based at London (UK) for over 40 years as a registered charity, provides expertise on inclusive design and access to the built environment for disabled and older people.

Institute for Human Centered Design (IHCD), founded in Boston (USA) in 1978, originally as *Adaptive Environments*, is an international non-governmental educational organisation committed to balancing expertise in legally required accessibility with promotion of best practices in human-centred or UD.

Global Universal Design Commission Inc. (GUDC), currently developing UD voluntary consensus standards for the built environment. The commission brings together some of the most knowledgeable and influential people from the USA in the areas of accessible design and legislation.

Design for All Institute of India, based in New Delhi with emphasis on promoting and establishing the concepts of Design for all in India and spread to Asia.

The RL Mace Universal Design Institute (UDI), based in North Carolina, is dedicated to promoting the concept and practice of accessible and universal design in all design disciplines, including housing, public-use buildings, outdoor and urban environments and related products.

- Other private foundations, associations and networks:

EIDD - Design for All Europe, is a European network as a federation of 34 Member Organisations in 23 European countries. It was originally founded in Dublin (Ireland) in 1993 under the name of *European Institute for Design and Disability* (EIDD), with the aim to use design to achieve the inclusion of the disabled people in society. This approach was reinforced with the inclusion of Design for All philosophy, as a more mainstream approach, enhancing the quality of life.

Design for All Foundation, based in Barcelona (Spain), founded short after April 1995 when the *EIDD General Assembly* took place and Barcelona, and the Design for All concept was introduced. Their aim is to form a group of leaders of the companies, organisations and administrations regarding sustainability and human diversity.

International Association for Universal Design (IAUD), based in Fukuoka (Japan) as a result of the *International Conference on Universal Design* in Japan 2002 where there was a call for a new, business-oriented organisation to be formed; in response to Japan's ageing demographic [see Ostroff, 2011: 1.4].

Universal Design & Service GmbH, based in Munich (Germany), organises the universal design award as an international competition that takes place once a year since 2008. Starting from July 2013, they have merged with *Industrie Forum Design e.V.* (iF e.V.), the oldest independent design institution in the world, founded in 1953.

UniversalDesign.com, a North-American philanthropic organisation publishing a quarterly Newsletter since 1993, available for free online. It is an informative magazine, managed and supported by an architectural accessibility consulting firm.

This list has been provided only for sampling purposes, to point out how different and diversified institutions find the topic interesting and urgent. We can observe how recognised institutions, such as the iF e.V. –one of the most renowned design institution in Germany– recently merged in July 2013 with Universal Design & Service GmbH and now embrace UD as a fundamental and necessary global, holistic strategy. Likewise, the Commission for Architecture and the Built Environment –one of the precursors of ID in the UK– merged with the Design Council in April 2011, tackling complex social issues such as ageing and obesity. What is more, UD / ID / DfA also creates business opportunities; see, for instance, ‘UniversalDesign.com’, which offers a vast amount of information on accessibility and has used marketing abundantly to publicize their consulting firm.

Another corporation in the previous list that is worth talking about is the Global Universal Design Commission Inc. (hereafter GUDC), which is currently developing voluntary UD consensus

standards for the built environment. Maisel [online, IV.1.d: 2] points out the rate of implementation as a potential barrier to voluntary UD standards, although she also hints at the willingness of governments and large organisations to adopt GUDC criteria:

“As a voluntary standard, there is no guarantee that builders, businesses, or government agencies will adopt the UD Standards developed by GUDC. Nevertheless, GUDC has begun to gain international support for its Standards Development efforts. Potential early adopters of the GUDC standards include: the London 2012 Organising Committee; the government of Ecuador; and the Paralympics Committee, which is planning the design of facilities for the 2014 Winter Games in Russia.” [Maisel, online: 2]

Not only do all the previously listed institutions and organisations have their own agenda on accessibility issues (as well as many others), but other networks have been created at different levels to support the exchange of knowledge on the topic. One of these is the already quoted EuCAN - European Concept for Accessibility Network. EuCAN is open to collaborating with any person whose professional activity is related to accessibility. Their participation must be on a purely volunteer basis, without the benefit of any funding, and with the final goal of joining forces to create a ‘European Agency’. Quoting the words of Silvio Sagramola, the network coordinator, this ideal European Agency would be “responsible for monitoring discussions on accessibility, gathering European official texts (...) and collecting examples of good practice which can be used as coaching tool and transferred to other situations” [EuCAN, 2003: 16]. This example of EuCAN’s willingness to create a unified understanding within Europe is nothing more than an attempt to use their own guidelines and means for finding coherence and order in the chaos of different standards and institutions.

Therefore, to sum up, there are several academics that are concerned with the topic and have defined their own principles for accessibility. Often, these have become quite synonymous, but on other occasions new perspectives on the topic have been disclosed. In an attempt to solve the problem of excessive information and the general lack of reliable criteria that the architecture practitioners must face nowadays, this Annex aims to provide a renewed approach towards accessibility and its related principles. The objective is to define the principles in a more embracing way, so that they are simpler to follow and more clear in terms of achievements. In other words, the essentials of inclusive architecture will be simplified and restructured according to the varied existing lists of principles of UD / ID / DfA while at the same time exclusively considering those redacted by renowned institutions concerned with the topic.

Essentially, the idea is to regroup the different principles into major steps that are hierarchically organized; that is, the approach will shift from lists of requirements that are equally important, to a set of steps categorized in levels of achievements. The idea is to reach an overall and more comprehensive understanding. Providing too precise and concrete definitions of principles has been avoided because this often leads instead to excluding ideas. Also, the steps will be defined from the specific point of view of architectural practice, which is in contrast with some other principle lists that have been redacted considering design in general, but not particularly with the built environment in mind. Furthermore, the basic knowledge erected from this dissertation has also been considered and included in the new updated set of steps.

A.2 Principles overview

A.2.1 The Principles of Universal Design [by CUD, North America]

Among all the previously listed institutions, it is necessary to especially highlight the most influential one: the **Center for Universal Design (CUD)**, based at the College of Design at NCSU in the USA.

Founded by the aforementioned Ronald L. Mace in 1989, it originally ran under a different name and it was not until 1996 when the centre officially changed its name to its current ‘Universal Design’. Already in 1997, the CUD redacted their own guidelines for good design, under the name *The Principles of Universal Design*, which, according to their webpage, are currently “referenced by over 6000 web sites worldwide and have been translated into French, German, Korean, Greek, Italian, Japanese, Norwegian, Portuguese, Spanish and Swedish. Soon to be added to this list will be Hindi, Arabic, Indonesian, Hebrew, and Chinese” [CUD, online (a)]. Wikipedia also refers to these principles when searching for ‘universal design’, as well as a large part of the specialised centres and institutions listed above. The fact is that these principles (see Tab.A.1) which are available in different formats online, are highly consulted and therefore addressing them is unavoidable:

Table A.1: The Principles of Universal Design, Version 2.0; by CUD

| |
|--|
| <p>1. EQUITABLE USE</p> <p>The design is useful and marketable to people with diverse abilities.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Provide the same means of use for all users: identical whenever possible; equivalent when not.</i> • <i>Avoid segregating or stigmatizing any users.</i> • <i>Provisions for privacy, security, and safety should be equally available to all users.</i> • <i>Make the design appealing to all users.</i> |
| <p>2. FLEXIBILITY IN USE</p> <p>The design accommodates a wide range of individual preferences and abilities.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Provide choice in methods of use.</i> • <i>Accommodate right- or left-handed access and use.</i> • <i>Facilitate the user’s accuracy and precision.</i> • <i>Provide adaptability to the user’s pace.</i> |
| <p>3. SIMPLE AND INTUITIVE USE</p> <p>Use of the design is easy to understand, regardless of the user’s experience, knowledge, language skills, or current concentration level.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Eliminate unnecessary complexity.</i> • <i>Be consistent with user expectations and intuition.</i> • <i>Accommodate a wide range of literacy and language skills.</i> • <i>Arrange information consistent with its importance.</i> • <i>Provide effective prompting and feedback during and after task completion.</i> |

4. PERCEPTIBLE INFORMATION

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.
- Provide adequate contrast between essential information and its surroundings.
- Maximize “legibility” of essential information.
- Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

5. TOLERANCE FOR ERROR

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- Provide warnings of hazards and errors.
- Provide fail safe features.
- Discourage unconscious action in tasks that require vigilance.

6. LOW PHYSICAL EFFORT

The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

- Allow user to maintain a neutral body position.
- Use reasonable operating forces.
- Minimize repetitive actions.
- Minimize sustained physical effort.

7. SIZE AND SPACE FOR APPROACH AND USE

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

- Provide a clear line of sight to important elements for any seated or standing user.
- Make reach to all components comfortable for any seated or standing user.
- Accommodate variations in hand and grip size.
- Provide adequate space for the use of assistive devices or personal assistance.

Source: [Connell *et al.*, 1997: online]

It is worth mentioning that the authors especially remark that “all guidelines may not be relevant to all designs”, and that the principles “address only universally usable design, while the practice of design involves more than consideration for usability. Designers must also incorporate other considerations such as economic, engineering, cultural, gender, and environmental concerns in their design processes” [Connell *et al.*, 1997: online]. According to Story [2011: 4.4], in addition to the principle title (level 1) and the related guidelines (level 2), the authors envisioned two additional levels of detail that would be eventually developed. Level 3 would be compliance tests, and an example of it can be already found on the CUD webpage [CUD, online (d)], which consists of questions that would allow designers to query a design for universal usability (see Fig.A.1).

Figure A.1: Evaluating the Universal Design Performance of Products

| PRINCIPLE ONE EQUITABLE USE | | | | | | | | Comments |
|-------------------------------|--|----------------|-------------------|----------|---------|-------|----------------|----------|
| | | Not Applicable | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree | |
| 1A. | All potential users could use this product in essentially the same way, regardless of differences in their abilities. | | | | | | | |
| 1B. | Potential users could use this product without feeling segregated or stigmatized because of differences in personal capabilities. | | | | | | | |
| 1C. | Potential users of this product have access to all features of privacy, security, and safety, regardless of personal capabilities. | | | | | | | |
| 1D. | This product appeals to all potential users. | | | | | | | |

Source: [CUD, online (d)]

While level 4 would be about design strategies, as Story [2011: 4.4] explains:

“Level 4, which would offer strategies for meeting guidelines and passing the tests, would have several discipline-specific branches. For example, for Principle 3, Simple and Intuitive Use, the level 4 design strategies might describe the following:

- For architecture—methods of creating clear environment way-finding features
- For products—methods of applying concepts of correspondence and cognitive mapping to user interfaces
- For software—methods of supporting broadly accessible user interaction modes”

Therefore, as level 4 clearly shows, the UD principles were redacted not exclusively for the built environment design, but also to include basic and generic concepts that can be applied to different fields. It is important to bear in mind this consideration, since the aim of this dissertation focuses primarily on architectural design.

A.2.2 The Principles of Inclusive Design [by CABE, United Kingdom]

Similarly, other institutions have also redacted their own guidelines about what UD / DfA / ID or some other similar terminology should mean. In the terrain of ID, it is worth referring to the **Commission for Architecture and the Built Environment** (hereafter CABE), which was key in building an understanding of ‘inclusive design’ in the UK.

CABE was the UK government’s advisor on architecture, urban design and public space from 1999 to 2011. Although it merged into a charity named Design Council in 2011, their contents are still available on the net, thanks to The National Archives. The *Seven principles of good design* were published on the CABE webpage. Referring to them is relevant because, while the previously listed principles from CUD regarding design were written in the broadest sense, the CABE principles were instead conceived exclusively from the point of view of architecture and urban design. As architectural design is the main focus of the present dissertation, they deserve a special reference; thus Tab.A.2, next, lists the principles together with a short description. Guidelines are noted after each of them in the form of ‘*questions to ask yourself*’, just to help further in their comprehension:

Table A.2: Seven Principles of Good Design; by CABE

| |
|--|
| <p>1. CHARACTER - A place with its own identity</p> <p>Successful places are distinctive and memorable. All the elements of the built environment work together to create a character that reflects the identity of the place and its community.</p> <p>When new shops and houses are identical to those in every other town, a place risks weakening its connection with its history and losing the things that make it stand out when competing for investment and skilled people.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Is the place’s distinctive character reflected in the way it is laid out and landscaped?</i> • <i>Does it respond to and reinforce locally distinctive patterns of development, landscape and culture?</i> • <i>Do buildings, public spaces, landscaping, street furniture and public artwork together present a coherent image and identity?</i> |
| <p>2. CONTINUITY AND ENCLOSURE - A place where public and private spaces are clearly distinguished</p> <p>Buildings can define open spaces by enclosing them. The activities inside buildings can bring life and activity to the edges of public spaces. And buildings can secure private open spaces by closing them off and overlooking them.</p> <p>In places where the distinction between public and private open space is blurred, responsibility for looking after open spaces is uncertain and privacy can be compromised. Successful places therefore need a clear relationship between the public fronts and private backs of buildings.</p> |

| |
|---|
| <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Is the street lively? Do people come and go from buildings and are they drawn to the activities inside buildings (retail, for example)?</i> • <i>Are streets made up of continuous frontages of buildings and open spaces, or are there unintentional gaps that leave the street lifeless or uninteresting?</i> • <i>Do buildings enclose space and separate private and public areas?</i> • <i>Do buildings overlook public spaces to improve surveillance and security?</i> • <i>In residential developments, are back garden fences accessible to intruders or are they closed off by other homes?</i> |
| <p>3. QUALITY OF THE PUBLIC REALM - A place with attractive and well-used outdoor areas</p> <p>Successful places have outdoor spaces that are attractive and comfortable. These places will have invested in the public realm as a demonstration of civic pride and the value attached to public life. Outdoor spaces are important for the health of local people, encouraging sports and healthy lifestyles. Public spaces can include parks, allotments and nature reserves, as well as more formal squares and paved areas. Streets are also part of the public realm. Designed with people in mind, they offer opportunities to meet and socialise, bringing vitality to a place.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Does the place have public spaces and routes that are attractive, safe and uncluttered?</i> • <i>Does the place provide open space that is easy for everyone to use, including children, disabled and elderly people?</i> • <i>Does the public realm provide a setting for important buildings or public art?</i> • <i>Are the choices of materials durable and easy to maintain? Will they weather well over time?</i> |
| <p>4. EASE OF MOVEMENT - A place that is easy to get to and move through</p> <p>A place should always be easy for everyone who uses it, whether they are on foot or by bicycle, car or public transport. Pedestrians in particular should be able to get around safely and conveniently. Making a place more walkable and accessible will help reduce car use and in turn reduce congestion and air pollution and improve public health.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Are places connected with each other and easy to move through?</i> • <i>Does the place provide a choice of routes, especially for pedestrians?</i> • <i>Does it prioritise pedestrians over vehicles?</i> • <i>Does the layout of the place uses minimise the need to travel and exploit any proximity to public transport?</i> • <i>Do you need pedestrian subways or bridges to get over or under roads when a crossing at street level would be more convenient?</i> |
| <p>5. LEGIBILITY - A place that is easy to navigate</p> <p>Successful places are easy to find. Knowing where you are and how to get around is essential to enjoying a place and all its attractions. We intuitively use all sorts of clues to navigate. The size and type of buildings tell us whether we are on an important route or a side street. Buildings, landscape or public art can stand out from the everyday fabric of a place, making its location more memorable. This is important for people who are visiting for the first time and want to feel confident and relaxed in order to enjoy a place and all its attractions, and not anxious about getting lost. But it is also very important for people with learning disabilities, who do not necessarily find ordinary signage helpful.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Does the place have recognisable routes, intersections and landmarks to help people find their way around?</i> • <i>Are landmark buildings visible at street level?</i> • <i>Do landmarks stand out from their surroundings - and are they memorable?</i> • <i>Can public art or landmarks help you find your way around?</i> • <i>Do the scale of the buildings and the design of the street, its furniture, lighting and surfaces tell you about the importance of a route?</i> |
| <p>6. ADAPTABILITY - A place that can change easily</p> <p>Places should be able to accommodate change over time, create continuity with the past and respond to new social, market or environmental demands. Climate change means the design of places should be flexible enough to be able to respond to changes in weather patterns. When places do not include different ownerships and uses, more effort will be needed to accommodate change in future. It may be best to avoid blocks that have just one use, as they will be difficult to adapt in future.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • <i>Can buildings be adapted to meet changing social, technological and economic conditions?</i> • <i>Can existing buildings be adapted to new uses rather than replaced with new buildings?</i> • <i>Can the design of the place be modified over time to cope with a changing climate?</i> • <i>Does the design of major developments allow for incremental change instead of wholesale demolition?</i> • <i>Can homes adapt to changing family needs including the needs of people with disabilities?</i> |

7. DIVERSITY - A place with variety and choice

Successful places offer a variety of uses and activities, shops and services. Choices in employment and housing for households of all sizes and incomes are important to making a place inclusive and welcoming.

A place is successfully designed if it can be used by as many people as possible, regardless of their physical ability or background. It needs to be accessible.

A range of different architecture adds interest and can reflect the diversity of the local community. Variety in landscape treatment and wildlife habitats can help support biodiversity.

Guidelines:

- *Can the mix of uses work together to create viable places that respond to local needs?*
- *Will the ranges of activities and uses of the area contribute to the vitality of the place at different times of the day and week?*
- *Is there a variety of building forms and architectural expression?*
- *Can everyone use the place, regardless of their physical ability?*
- *Does it promote biodiversity and a variety of habitats for wildlife?*
- *Does it provide people with a choice of housing, shopping, employment and entertainment?*
- *Does the place reflect the diversity of the local community and its culture?*
- *Can the development provide new local employment opportunities, for instance with live-work units?*

Source: [CABE, online]

In addition, CABE published an entire issue dedicated to ID principles, entitled *The principles of inclusive design. (They include you.)* [Fletcher, 2006]. In order to provide new light on the topic, these principles are addressed as well (see Tab.A.3), since they differ to some extent from those that were analysed previously. Again, each principle has a title with a short description, which on almost all occasions is complemented by extra information in the form of examples:

Table A.3: The Principles of Inclusive Design; by CABE (bis)

1. Inclusive design PLACES PEOPLE AT THE HEART OF THE DESIGN PROCESS

Design and development should create spaces and buildings that people can use to form strong, vibrant and sustainable communities. To achieve this, you should ensure that you involve as many people as possible on the design. This will help to promote personal well-being, social cohesion and enjoyment for all.

Guidelines:

- *As an obvious first step, avoid steps. Replace them with a gentle incline between floors and add low window-sills for a better view.*
- *Wheelchair access should be the base level, not an optional extra. The same goes for pushchair access.*

2. Inclusive design ACKNOWLEDGES DIVERSITY AND DIFFERENCE

Good design can be achieved only if the environment created meets as many people's needs as possible. Everyone at some point will probably experience limited mobility – as a tourist laden with bulky luggage, a parent with young children, an older person or an individual with injuries. It is important to identify barriers to inclusion as early as possible within the design process so that good design can overcome them.

Inclusive design celebrates the diversity of people and should not impose disabling barriers. While the needs of wheelchair users and mobility impaired people are important it is also necessary to understand the barriers experienced by people with learning difficulties, mental ill health, visual impairments and hearing impairments.

Guidelines:

- *See that doors are highly visible. Lay non-slip mats and make automatic doors the automatic choice.*

3. Inclusive design OFFERS CHOICE WHERE A SINGLE DESIGN SOLUTION CANNOT ACCOMMODATE ALL USERS

An inclusive environment does not attempt to meet every need. By considering people's diversity, however, it can break down barriers and exclusion and will often achieve superior solutions that benefit everyone. Disabled people are not homogenous, of course, but considering their needs within the design process will secure benefits for everyone.

By applying the same high design standards to meet the access requirements of all users, a design embraces everyone on equal terms. An environment should exceed minimum technical specifications and inspire users.

4. Inclusive design PROVIDES FOR FLEXIBILITY IN USE

Meeting the principles of inclusive design requires an understanding of how the building or space will be used and who will use it. Places need to be designed so that they can adapt to changing uses and demands.

Guidelines:

- *Make space for everyone, including toddlers and wheelchair users. For your information, screens shouldn't be out of sight.*

5. Inclusive design PROVIDES BUILDINGS AND ENVIRONMENTS THAT ARE CONVENIENT AND ENJOYABLE TO USE FOR EVERYONE

Making environments easy to use for everyone means considering signage, lighting, visual contrast and materials. Access to buildings isn't simply a question of their physical layout. It also requires people having sufficient information, often before they leave their house, that makes them feel confident enough to access a building or space. Ensuring this 'intellectual' and 'emotional' access means considering signage, lighting, visual contrast and materials.

At the beginning of the design process it is important to analyse the transport patterns to and within a development. Roads, parking, walkways, building entrances and other routes should be considered. People's opportunity to use all elements within the site, including the inside of buildings, is crucial.

Guidelines:

- *A principle of inclusive design is a level playing field – and entrance – for everybody.*

Source: [Fletcher, 2006: 7-15]

It should be noted that in this publication five principles are explained in detail (see previous Tab.3), while at the end there is a short-list summary of seven concepts which should be the outcome of any design that follows the five principles set out in the report [Fletcher, 2006: 17]. These seven concepts are the ones used in the table that follows (Tab.A.4), together with a short description of each of them. In addition, an official document of the Royal Institute of British Architects (RIBA) complements these seven concepts with an eighth one [RIBA, 2009: 6-7], which is also included in the analysis.

Table A.4: The Outcomes of the Principles of Inclusive Design; by CABE (bis)

| |
|---|
| 1. INCLUSIVE; so everyone can use them safely, easily and with dignity. |
| 2. RESPONSIVE; taking account of what people say they need and want. |
| 3. FLEXIBLE; so different people can use them in different ways. |
| 4. CONVENIENT; so everyone can use them without too much effort or separation. |
| 5. ACCOMMODATING; for all people, regardless of their age, gender, mobility, ethnicity or circumstances. |
| 6. WELCOMING; with no disabling barriers that might exclude some people. |
| 7. REALISTIC; offering more than one solution to help balance everyone's needs and recognising that one solution may not work for all. |
| 8. UNDERSTANDABLE; everyone knows where they are and can locate their destination. |

Source: [Fletcher, 2006: 17] and [RIBA, 2009: 6-7]

It is worth noting that *Inclusive Design* is a strong movement in the UK with different institutions showing interest, and the precise definition of ID is still going through a process. The fact that London was chosen to be the city to hold the Olympic and Paralympic Games in 2012 provided the impetus to keep developing knowledge and ID good practice. In fact, the Olympic Delivery Authority (hereafter ODA) produced their own *Inclusive Design Standards* (hereafter IDS) in 2007, as "a mix of guidance and requirements generated from a large number of published guidance and good practice documents" [LLDC, 2013: 5]. The London Legacy Development Corporation (hereafter LLCD) adopted and further developed the original ODA's IDS, which has been superseded since 2007. As a result, the *Inclusive Design Standards* [LLDC, 2013] was published in March 2013. It is worth noting that the LLDC IDS have been redacted with the special support of the Built Environment Access Panel (BEAP), which was established in June 2010 and is made up of PwD and experts on ID.

The LLDC IDS are set out in four key parts: (1) Public Realm; (2) Residential Developments; (3) Public Buildings (including venues); and (4) Venues-Spectator and Participant Requirements. Each standard is formed by a short description of the design's intent, that is, an explanation of the standards' scope and justification for their ends. Additionally, some guidelines are provided, either in the form of national ratified norms (e.g., maximum ramp gradients, accessible parking dimensions, etc.) or in the form of diagrams and images exemplifying existing good practice. They specifically remark that the

guidelines serve only as a means of illustration and are not considered the only possible solution: “There may be equally satisfactory alternative physical operational solutions that achieve the same outcomes” [LLDC, 2013: 14]. Although they are based on existing standards and good practice guidelines, IDS recommendations are not legally binding.

Undoubtedly, it is a great good practice manual which is expected to be reviewed every three years, incorporating new examples of good practice or any other relevant changes. Although the guidelines are voluntary, in this case the manual includes all the legal requirements indicated by all current national standards. Thus, we can expect it to be a highly consulted document, at least in the UK.

A.2.3 The Principles of Design for All [by ECA, Europe]

As stated earlier, the **European Concept for Accessibility** [hereafter ECA] advocates a *Design for All* concept and also provides a list of principles specifically concerning the built environment design, so that it is accessible to everyone [EuCAN, 2003: 20]. It is worth mentioning that the person in charge of redacting the text was Francesc Aragall, the President of the Design for All Foundation; therefore the foundation supports these same principles as well. The following Tab.A.5 shows the updated version of the principles found in EuCAN’s last publication in 2008:

Table A.5: Principles of Design for All; by ECA

| |
|--|
| <p>1. RESPECTFUL It should respect the diversity of users; nobody should feel marginalized and everybody should be able to get to it.</p> |
| <p>2. SAFE It should be free of risks to all users; therefore, all those elements which form part of an environment have to be designed with safety in mind (slippery floors, parts jutting out, dimensions, etc.).</p> |
| <p>3. HEALTHY It should not be a health risk or cause problems to those who suffer from certain illnesses or allergies.</p> |
| <p>4. FUNCTIONAL It should be designed in such a way that it can carry out, without any problems or difficulties, the function for which it was intended.</p> |
| <p>5. COMPREHENSIBLE All users should be able to orient themselves without difficulty within a given space, and therefore the following is essential: Information must be clear and the spatial distribution must be coherent. <p>a) Clear information: means use of icons that are common to different countries, avoiding the use of words or abbreviations from the local language which may lead to confusion; for example, using the letter C on taps, which suggests Cold in English but Caliente (meaning hot - exactly the opposite) in Spanish.</p> <p>b) Spatial distribution: this should be coherent and functional, rather than segregating and exclusive.</p> </p> |
| <p>6. AESTHETIC The result should be aesthetically pleasing, as this will make it more likely to be accepted by everybody (the previous five points always being borne in mind).</p> |

Source: [EuCAN, 2008: 14]

Note: The latest EuCAN publication *Design for All in progress — from theory to practice*, was expected to be published in 2013 but is still not available to the public at the present moment of redaction of this chapter (February 2014).

A.2.4 The Universal Design India Principles [by NID, India]

Finally, it is noteworthy that the *National Institute of Design* (NID) in Ahmedabad, India, has also recently collaborated with 9 Indian experts on the topic to develop their own principles list: the *Universal Design India Principles* (UDIP). They depart from the seven principles of UD described by CUD, but introduce relevant aspects of usability, culture, economics and aesthetics. The aim is to address social and cultural diversity, which is believed fundamental in a country with so many differences in languages, cultures, economics and regions [Mullick *et al.*, 2011: online]. Furthermore, the principles have been also translated into Hindi, the national language of India, with a choice of “Hindi words that rhyme well together to make them simple, easy to remember and present to a larger audience in India” [Khare *et al.*, 2011: 2], so that the UDIP can be understood across the nation.

In other words: “The Universal Design India principles are based on the cultural needs of the Indian people; they acknowledge the seven principles of Universal Design (USA) and build their social and equitable agenda to address the cultural needs of Indian people” [Khare *et al.*, 2011: 2]. Thus, they recognise CUD’s principles and do not pretend to build upon them, but to complement them for better understanding in the Indian context. Similar to the CUD’s principles, UDIP are not specifically described for the built environment design, but are conceived for a larger scope of application, “ranging from product / industrial / communication design to built environments and human interfaces, from design education to policy making, from social to national integration” [Mullick *et al.*, 2011: online].

Tab.A.6 below displays, the title of each UDI principle with the Hindi equivalent in brackets and its description and guidelines. The following Fig.A.2 shows the poster prepared for their diffusion and their Sanskrit translation.

Table A.6: Universal Design India Principles; by NID

| |
|---|
| <p>1. EQUITABLE (SAMAN) The design is fair and non-discriminating to diverse users in Indian context.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • Avoid prejudices against people of all ages, gender, disability, sizes, caste, class and religion. • Consider different capabilities of users and build in many levels of engagement. • Provide choices in access and use thru flexibility and customization. • Allow personalization through inclusion of adjustable and adaptable options. • Provide equality in challenge, opportunity and energy requirement. |
| <p>2. USABLE (SAHAJ) The design is operable by all users in Indian context.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • Provide independence, comfort, safety and support during use. • Facilitate access, operation and convenience by diverse users. • Include adaptations for those experiencing difficulty in use. • Provide clarity in use, operation and maintenance to minimize instruction and avoid confusion and error. • Adopt simple means to overcome complex operation. • Follow cultural norms to address user expectations. • Offer multi-sensory feedback to point in the right direction. • Build in intuitive operation and innate understanding of problem. • Allow easy adaptation to facilitate use by people with diverse abilities. • Prevent costly mistakes and untended consequence from misuse. |
| <p>3. CULTURAL (SANSKRITIK) The design respects the cultural past and the changing present assist all users in Indian context.</p> <p><i>Guidelines:</i></p> <ul style="list-style-type: none"> • Maintain social and traditional qualities in design. • Include Indian idioms to make historic and social connection. • Present in many languages for inclusive comprehension. • For all castes and society levels. • Respond to local context and conditions. • Employ appropriate technology to match user expectations. |

4. ECONOMY (SASTA)

The design respects affordability and cost considerations for diverse users in Indian context.

Guidelines:

- *Ensure affordability, durability and maintainability.*
- *Use local materials for energy savings and cost effectiveness.*
- *Focus on low unit cost through wide distribution.*
- *Adopt modular approach to offer choice in features and price range.*

5. AESTHETICS (SUNDAR)

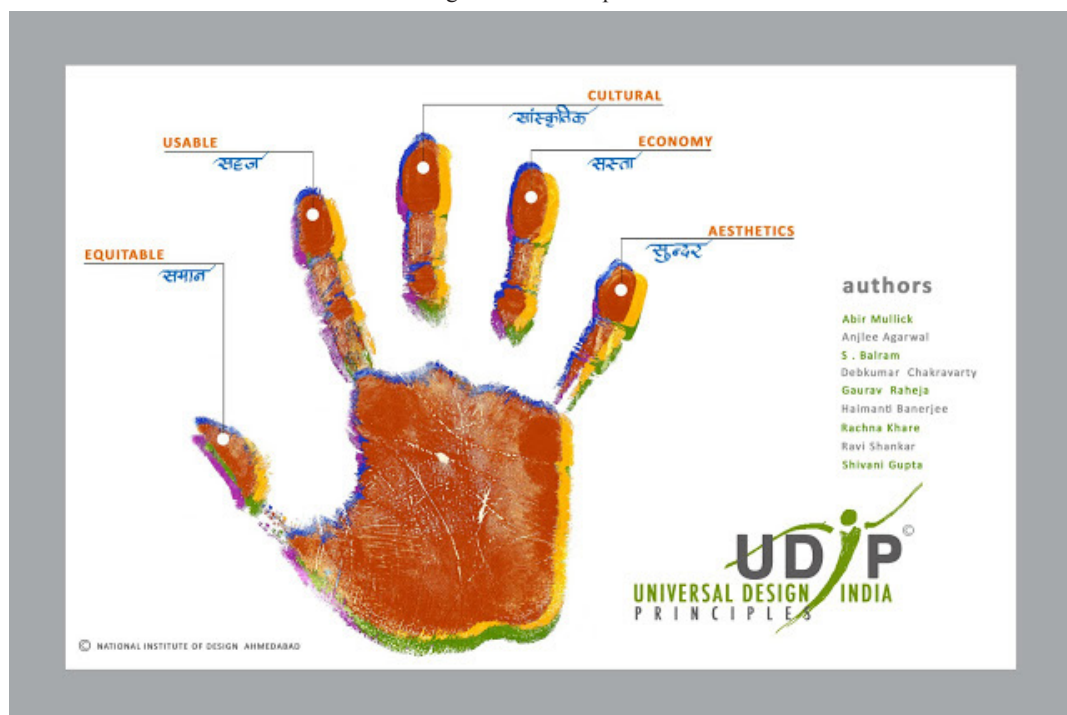
The design employs aesthetic to promote social integration among users in Indian context.

Guidelines:

- *Employ aesthetic to enhance universal appeal and use.*
- *Allow personalizing aesthetics through flexibility, adaptability and modularity of colour, form, texture and interaction.*
- *Employ appearance to inform use and safety.*
- *Bridge wide range of meaning and comprehension gaps.*

Source: [Khare *et al.*, 2011: 7-8]

Figure A.2: UDIP poster



Source: [Mullick, *et al.*, 2011: online]

A.2.5 Comparative analysis

A great part of the problem of implementing accessibility stems precisely from the excessive and diversified information on the topic, which generates confusion and lack of reliable criteria on the part of professionals. Therefore, it is pertinent to list a comparison of the several, previously mentioned principles.

I will attempt to unearth the basics and gain a broader understanding of how an accessible, inclusive, designed for all environment should be. Thus, a summary chart (see Tab.A.7) is presented next, in such a way that the title of each principle from all the earlier lists is enumerated together with their respective keywords or short explanations. Often, all the lists present similar concepts, sometimes using different words, but meaning the same objective. On other occasions the principles refer to

different approaches worth noting. Therefore, the most renowned *Principles of Universal Design* are placed in the first row so that CABE's, ECA's and NID's other principles can be referred to equivalently. Those principles that cannot be matched with any of the UD principles have been considered novel concepts to take into account for adding relevant connotations; they are listed in the last rows and highlighted in green.

Note: In the case of the list of principles published by CABE [Fletcher, 2006], the summary and RIBA's contribution (previous Tab.A.4) are used in the following summary chart. They are identified as *Principles of ID (CABE bis)*.

Table A.7: Summary chart: Comparison of Principles of UD / ID / DfA

| Principles of UD [CUD] | Principles of Good Design [CABE] | Principles of ID [CABE bis] | Principles of DfA [ECA] | UD India Principles [NID] |
|--|---|--|--|--|
| 1. Equitable Use <i>Same means of use; avoid segregation; appealing to all users.</i> | | 1. Inclusive <i>Everyone can use places safely, easily and with dignity.</i> 5. Accommodating <i>For all people, regardless of their age, gender, mobility, ethnicity or circumstances.</i> 6. Welcoming <i>With no disabling barriers that might exclude some people.</i> | 1. Respectful <i>Respect the diversity of users; nobody should feel marginalised.</i> | 1. Equitable (Saman) <i>Fair and non-discriminating to diverse users; provide flexibility and customization; allow adjustable and adaptable options.</i> |
| 2. Flexibility in Use <i>Provide choice; adaptability.</i> | 6. Adaptability <i>Places that can easily accommodate changes over time.</i> 7. Diversity <i>Places with variety and choice.</i> | 3. Flexible <i>Different people can use places in different ways.</i> | | |
| 3. Simple and Intuitive Use <i>Easy to understand and to use; eliminate complexity.</i> | 5. Legibility <i>Places that are easy to locate and navigate.</i> | 8. Understandable <i>Everyone knows where they are and can locate their destination.</i> | 5. Comprehensible a) Clear information <i>Use of icons that are common to different countries.</i> b) Spatial distribution <i>Coherent and functional, rather than segregating and exclusive.</i> | 2. Usable (Sahaj) <i>Autonomous, comfortable, safe and supportive use; easy access and operation; minimize instructions and avoid confusion and error; multisensory feedback; build intuitive understanding.</i> |
| 4. Perceptible Information <i>Use different modes for presenting information; maximise legibility.</i> | | | 2. Safe <i>Free of risks to all users.</i> | |
| 5. Tolerance for Error <i>Minimise hazards; discourage tasks that require vigilance.</i> | | | | |
| 6. Low Physical Effort <i>Minimise repetitive actions and fatigue; neutral body position.</i> | 4. Ease of movement <i>Places that are easy to get and move through, specially pedestrians.</i> | 4. Convenient <i>Everyone can use places without too much effort or separation.</i> | 3. Healthy <i>Not cause problems to those who suffer from certain illnesses or allergies.</i> | |
| 7. Size and Space for Approach and Use <i>Design for any user's body size, posture, or mobility.</i> | | | | |

| Principles of UD [CUD] | Principles of Good Design [CABE] | Principles of ID [CABE bis] | Principles of DfA [ECA] | UD India Principles [NID] |
|---------------------------|---|--|---|--|
| | 1. CHARACTER <i>Identity; distinctive and memorable places.</i> 2. CONTINUITY AND ENCLOSURE <i>Clear distinction between public and private open spaces.</i> 3. QUALITY OF THE PUBLIC REALM <i>Attractive and comfortable outdoor spaces.</i> | 2. RESPONSIVE <i>Taking account of what people say they need and want.</i> 7. REALISTIC <i>Offering more than one solution to help balance everyone's needs and recognising that one solution may not work for all.</i> | 4. FUNCTIONAL <i>The function intended should be carried out, without any problems or difficulties.</i> 6. AESTHETIC <i>Aesthetically pleasing; more likely to be accepted by everybody.</i> | 3. CULTURAL (Sanskritik) <i>Respect social and traditional qualities in design; include Indian idioms; respond to local context and conditions.</i> 4. ECONOMY (Sasta) <i>Ensure affordability, durability and maintainability; use local materials; modular approach to offer choice in features and price range.</i> 5. AESTHETICS (Sundar) <i>Aesthetic design to enhance appeal and use; allow personalizing aesthetics through flexibility, adaptability and modularity; employ appearance to inform use and safety, and bridge meaning and comprehension gaps.</i> |

Source: Own elaboration

To conclude the previous comparative table, all CUD principles have been matched with either CABE's, CABE bis', ECA's or NID's list in an effort to identify equivalences in meaning and/or new concepts. Regarding the equivalences:

- 1 CUD principle approximately corresponding to 1 or more principle from the other lists, e.g.: **Flexibility in use** [CUD] = **Adaptability** and **Diversity** [CABE]; **Flexible** [CABE bis]; **Equitable (Saman)** [NID];
- And vice versa (several CUD principles corresponding approximately to 1 single principle from the other lists); e.g.: **Simple and intuitive use** and **Perceptible Information** [CUD] = **Legibility** [CABE]; **Understandable** [CABE bis]; **Comprehensible** [ECA]; **Usable (Sahaj)** [NID].

It is worth remembering that CUD principles were redacted addressing design in the broadest sense, that is, also including the design of products or software; while both CABE's and ECA's principles were defined specifically with the field of architecture and built environment in mind. That is why we can find one single CABE / CABE bis / ECA principle embracing more than one CUD principle, for the mere reason that while the former refer to the specific field of architecture and built environment, the latter also includes the design of products in its approach, hence the need for further specifications described in different principles. Likewise, that is why the CUD principle **Size and space for approach and use** is not specifically matched with any of the other principles of the different lists, since it basically refers to architectural design and this is already assumed in CABE's and ECA's lists, which are conceived exclusively for the built environment. Thus, it is a *sine qua non* condition.

On the other hand, NID's principles are based on those of CUD, that is, they also address the design of environments, products and/or software. They are also specifically written to suit the Indian context. As stated by the authors, "Universal Design India Principles are developed to complement these principles [the Seven Principles of Universal Design (USA)] and contextualize them to address regional requirements" [Khare et al., 2011: 8]. Therefore, in the previous summary chart displayed in Tab.A.7, 2 NID's principles have been matched embracing basically all 7 CUD principles, while the other 3 remaining NID principles are considered 'new'.

What is more, it is worth noting that the CUD principle **Equitable use** is the most misleading one: 'equitable use' is defined as 'same means of use' by the North-American scholars, which suggests the idea of same solutions for all. The other lists of principles do not use this word, but refer to other terms such as 'inclusive', 'accommodating', 'welcoming' or 'respectful'. One exception is the list of Indian principles, which do use the word 'equitable' together with its Sanskrit equivalent '*saman*' (which may have a different connotation in its original language), noting that it is also complemented with the subtitle 'fair and non-discriminating'. In fact, the word 'equitable' faces the same controversy as the term 'universal design' (coined in the USA at the end of the 20th century), which more and more is becoming replaced by the term 'inclusive design' (the expression preferred in the European context and which was advocated almost one decade later).

Regarding the new concepts, let us explore those that have appeared during the review of principles, highlighted in blue in Tab.A.7, by reasoning out their innovative approach:

New concepts stated by the CABA [online]:

CHARACTER: This concept relates to the identity of the built environment. It evokes notions of culture, history, heritage, etc., which are essential in order to *connect* with the space and its *meaning*. This principle is also basic for arriving at a successful acceptance and inclusive use of the built environment, and it will be analysed and discussed in other chapters of this dissertation.

CONTINUITY AND ENCLOSURE: This concept refers to the relationship between the private and public realm, so that lost spaces and lifeless spots are not created. When the distinction between public and private open space is blurred, responsibility and privacy issues can become uncertain and compromised, as CABA describes.

QUALITY OF THE PUBLIC REALM: This concept addresses important matters such as *attractiveness*, *quality of life*, *wellbeing* and *comfort*, which are fundamental in the conception of the 'inclusive built environment'; notions that will also be thoroughly researched further.

New concepts stated by the CABEbis [Fletcher, 2006: 17]:

RESPONSIVE: This refers to taking into account what people say they need and want. In other words, it evokes ideas of *participation*, *collaboration*, *co-design*, etc., which are essential for a successful inclusive design, as will be discussed in greater detail in later sections of this dissertation.

REALISTIC: This concept, defined as "offering more than one solution to help balance everyone's needs, and recognising that one solution may not work for all", is one of the most relevant for understanding the terminology conflict *universal* vs. *inclusive*. 'Realistic', understood in this sense, overcomes the frequently generated misconception of the term 'universal' in the context of UD: People frequently follow the line of thought 'universal design = universal solutions = one unique solution that fits everyone regardless of their special needs', which is unrealistic and thus the reason for specifying the definition of this principle.

New concepts stated by the ECA [EuCAN, 2003: 20 and 2008: 14]:

FUNCTIONAL: This specific word does not appear in any of the other lists of principles, perhaps because it is somehow understood and taken for granted in design. Indeed, Steinfeld and Maisel [2012: loc.962] state: “Usefulness is the quality that underlies the concept of universal design”. Regardless, it is not superfluous to remark: all design must be functional and usable for its aims.

AESTHETIC: This specific concept, which does not appear in the other lists of principles (except for the NID’s), is basic for achieving real inclusiveness, because the general population will only use accessible environments if they are aesthetically pleasant as well. This concept will be explored precisely and argued in further sections of this dissertation.

New concepts stated by the NID [Khare *et al.*, 2011: 7-8]:

CULTURAL (*Sanskritik*): To some extent, this concept relates to the previously analysed concept ‘character’, which was described by CABE; but here special attention is paid to Indian culture. In other words, it focuses especially on tradition, castes and society levels, and the use of local materials and technology. It also refers to including Indian idioms to ensure its inclusiveness for all the population. All these observations can be easily transferred to any other cultural context where local traditions, building materials and/or written communication are notably different from other countries.

ECONOMY (*Sasta*): This concept appears for the first time in all of the lists of principles. It is considered essential, since the affordability of design is a basic requirement for being inclusive to all. It will also be further discussed in this dissertation.

AESTHETICS (*Sundar*): As in ECA’s list, aesthetics appears to be a parameter to bear in mind when dealing with UD / ID / DfA. The perspective provided by the Indian scholars is worth addressing, because aside from its reference to aesthetics for enhancing appeal and use, it is also related to the need for allowing the personalisation of designs. In other words, it imparts special importance to ‘*customisation*’ for a better inclusion in the Indian region. This observation, again, is easily transferred to other cultural contexts, and it is indeed believed to be an essential parameter of accessibility, as will be discussed further in this dissertation.

A.2.6 Defining principles for accessibility (for all) still in process

Although the concepts addressed are obviously very close in meaning, there is no clear consensus on the terminology and principles concerning accessible design for everyone.

On the one hand, it is undeniable that UD principles have been widely used worldwide –note that they have been officially translated to at least, 11 languages– and they are still one of *the* main, if not *the* main, reference in the field. On the other hand, it nevertheless seems that nobody is completely satisfied with the UD definition, as several scholars criticising its limitations can be found. Indeed, of all the many variants of the UD Definition and Principles that appear in the literature, scholars have suggested that none of them quite fit all stakeholders’ needs, as Steinfeld [2006a: online] acknowledges in his *Position Paper* on the future of UD.

UD philosophy, as repeatedly stated, has an extensive approach: it addresses not only the design of the built environment, but also the design of products and services. This is so to such an extent that UD has been adapted to specific fields, e.g., in the learning sciences. Thus, the application of UD principles has developed into an educational framework with similar names such as Universal Design

for Instruction (UDI), Universal Instructional Design (UID), or Universal Design for Learning (UDL) among others. We should also keep in mind the creation of institutions such as the Center for Universal Design in Education (CUDE) from the University of Washington, or the list of *Principles of Universal Design for Instruction*, which are based on the original seven *Principles of Universal Design* but have been updated to 9 principles by scholars from the University of Connecticut [Scott, McGuire, and Shaw, 2003]. Likewise, in the field of computer systems, we can also find theories for accessible computing, which were originally based on UD but have evolved into their own framework with a completely renewed approach. This field has even coined a new term: “ability-based design, which shifts the focus of accessible design from disability to ability” [Wobbrock, et al. 2011: 9.20].

Therefore, the definition of UD (or even the terminology) and its guiding principles is still sought nowadays; it seems that people constantly need to add or specify new meanings and considerations toward the topic in order to understand it better. To provide one example among many, in the first German national *Universal Design Expert Conference*, organised in Weimar by Bauhaus University in November 2009, all participants signed the *Weimar Declaration*, which defines a series of guiding principles for UD (see Fig.A.3):

Figure A.3: Principles of UD - Weimar Declaration

The signatories of the Weimar Declaration hereby state that:

- universal design** places the main focus on people.
- universal design** is not only a design topic.
- universal design** is an interdisciplinary task.
- universal design** is open to all users.
- universal design** creates service systems.
- universal design** is a process, not a standard.
- universal design** promotes social inclusion.
- universal design** deals with questions concerning the future.
- universal design** is a mindset and a responsibility.
- universal design** must be firmly anchored in the education system, early and continually.
- universal design** undertakes to enlighten the worlds of politics and industry.
- universal design** secures and promotes economic growth.

Source: [Arnt et al., 2009]

The book *Universal Principles of Design* [Lidwell et al., 2010] is another perfect example that illustrates further this need to define the concept of designing for all. This monograph—with the subtitle *125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design*—provides dozens of principles in the form of guidelines or general design considerations in order to strengthen the understanding of human perception towards design. Although the authors claim that the principles are useful for all design disciplines [2010: 12], all the provided guidelines focus mainly on product and graphic design rather than building design, which has also been observed in the renowned *Principles of Universal Design*, from CUD.

Aside from this critical remark, CUD’s principles have received many other criticisms, such as their: vague nature, incomprehensibility, untranslatability, and lack of focus on other important components such as affordability, aesthetics or social implications. Sandhu [2011: 44.8] goes much further, demanding a global evolution in the formulation of the principles in order to ensure its viability in the near future:

“Revisions must include the concepts of coherence, cost-effectiveness, design for self-sufficiency, sustainability, cultural contexts, modularity, environmental considerations, poverty, designing out waste, sustainable packaging, designing for emergencies, design for disaster relief, patient safety, standards, and other human-centered issues in order to be a comprehensive tool.”

For Sandhu, there is a need to acknowledge the impact of globalisation and to reduce global inequality, which necessarily requires combining sustainability issues with UD / ID / DfA. On the other hand, Steinfeld focuses more on the need to revise the societal and psychological effects of UD in his written collaboration in *The State of the Science in Universal Design* [Maisel, 2010]:

“In moving forward, the most commonly used definition of universal design and the Principles need to be revised to insure that they are clear, easy to understand, and express believable and concrete goals. They also should reflect social participation outcomes (including the broader social justice agenda) explicitly and address the emotional side of design, e.g. aesthetics (ECA, 2003)’. [Steinfeld, 2010: 2]”

Two years later, in their latest book, Steinfeld and Maisel [2012: loc.2516] gather up all the main critiques on UD developed over the years, and summarise them in nine remarks:

1. **“Fit with needs in the field”**: As stated several times, UD principles are more suited to product design than other design disciplines, and the guidelines lack detail.
2. **“The issue of appearance”**: Stigmatising appearances must be avoided, since a universal design cannot be successful if it makes the user look awkward, or attracts undesirable attention. [Note that this criticism is remedied in both ECA’s and NID’s principle ‘*Aesthetics*’].
3. **“Language”**: The language used must be revised, since it seems to imply opposite meanings to its purpose. For example, ‘*Tolerance for Error*’ implies that errors should be tolerated, and ‘*Flexibility in Use*’ suggests that objects should bend during use. In addition, translation of the principles’ to other languages can be misleading; for instance, the literal translation of ‘*Equitable in Use*’ in Japanese is ‘*equal opportunity*’, which denotes a different meaning. [Note that this criticism is addressed in NID’s list of principles, where all of them are matched with their equivalent word in Sanskrit].
4. **“Goals”**: There is a lack of clarity in the purpose of the principles. In other words, ‘*Equitable Use*’ denotes social justice; ‘*Flexibility in Use*’ refers to design strategy, while the rest relate to human performance goals. What is more, some principles overlap in objectives.
5. **“Scope”**: The principles fail to explicitly mention important issues on health promotion and disease prevention. [Note that this matter is addressed in ECA’s principle ‘*Healthy*’].
6. **“Fit with context”**: The principles must address contextual issues such as heritage or sustainability, as well as constraints such as affordability. [Note that this matter is partially addressed in CABE’s principle ‘*Character*’, as well as in NID’s principles ‘*Cultural*’ and ‘*Economy*’].
7. **“Narrow focus on personal empowerment”**: The principles do not consider personalisation and customisation options in design, which is basic for a more inclusive understanding. [Note that this criticism is addressed in CABE-bis’ principles ‘*Responsive*’ and ‘*Realistic*’, while NID’s principles ‘*Equitable*’ and ‘*Aesthetics*’ also mention concepts of personalisation and customisation].
8. **“Difficulty for benchmarking”**: There are no criteria by which to measure the ‘universality’ of an environment, product, or service design.
9. **“Lack of an evidence base”**: The principles are not accompanied by examples of their use in real practice; therefore they remain conceptual approaches rather than based on practical evidence.

In addition, Steinfeld and Maisel [2012: loc.2574] also review the aforementioned 4 levels envisioned by the authors of the principles (see previous Fig. A.3), and now advocate 4 types of information:

- 1) Goals, as the total scope of the concept [new level]
- 2) Guidelines, as the specific criteria provided for a better understanding [same as previous level 2]

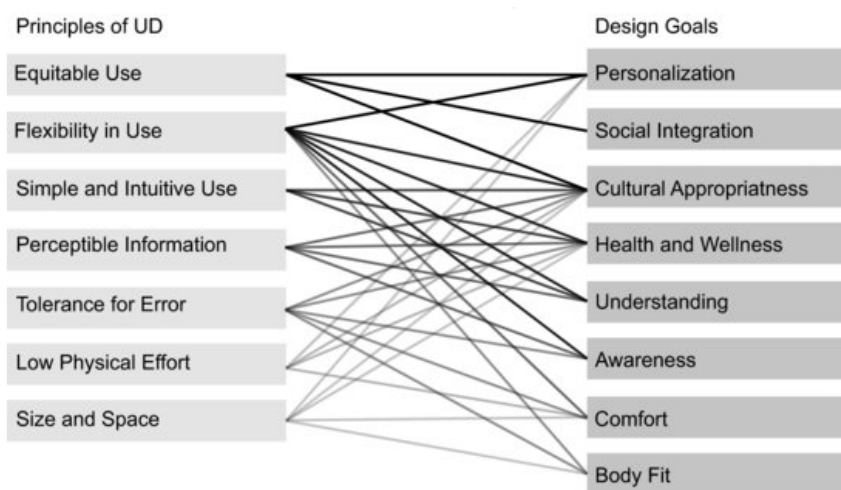
- 3) Strategies, as the potential approaches for meeting the guidelines [corresponding to previous level 4]
- 4) Best practices, as a means for providing the precedents of practical applications, ideally with graphic information [new level]

Thus, two new types of information are now envisioned: clear, specific goals for UD on the one hand, and on the other hand evidence-based information in the form of best practices examples. The latter requires time, since the compilation of practical evidence is a long way off. Concerning the former, a definition of eight Goals of Universal Design are already proposed by the authors [2012: loc.2583]:

- “**1. Body Fit:** Accommodating a wide range of body sizes and abilities
- 2. Comfort:** Keeping demands within desirable limits of body function
- 3. Awareness:** Ensuring that critical information for use is easily perceived
- 4. Understanding:** Making methods of operation and use intuitive, clear, and unambiguous
- 5. Wellness:** Contributing to health promotion, avoidance of disease, and prevention of injury
- 6. Social integration:** Treating all groups with dignity and respect
- 7. Personalization:** Incorporating opportunities for choice and the expression of individual preferences
- 8. Cultural appropriateness:** Respecting and reinforcing cultural values and the social and environmental context of any design project”

The goals are defined considering the critique of the Principles presented previously, and with the aim of empowering the new UD understanding based on improving human performance, health, and social participation. The authors provide a crosswalk diagram (see Fig.A.4) to show how the Goals relate to the Principles:

Figure A.4: Crosswalk between the Principles and Goals of Universal Design



Source: [Steinfeld and Maisel, 2012: loc.2609]

Goals 1-5 are oriented toward human performance, while goals 5-8 address social participation. Note that goal 5, ‘*Wellness*’, is a bridge goal that addresses both the categories of human performance and social participation. The authors comment that their efforts to summarize the goals in 8 concepts stems from the belief that this is the maximum number of items that people can easily remember. Note that these same goals are the ones defended by the aforementioned GUDC Universal Design Standards, the voluntary UD standards under development in the USA, since Steinfeld and Maisel also belong to this Commission.

It is worth adding that in spite of all the developed theories on UD (especially in the USA), there are many other institutions that are concerned with the topic and are developing their own approach.

For instance, the *Generation Research Program* (hereafter GRP), which is a funded interdisciplinary programme based at Ludwig Maximilian University Munich, carries out research focusing on human beings throughout their various stages of life, especially concerning issues related to ageing. GRP has described their own principles for attaining ‘quality of life’ through design, and a translation of them into English is facilitated by Herwig [2008: 18]:

“1) Accessibility (or barrier-free access) is the basis: It is an important goal for the whole of society, ensuring that products, services, workplaces, and environmental conditions are designed in such a way as to make them accessible for as many as possible.

2) Usability (or user-friendliness) is the next step: Denotes the usability of a product by describing to a certain user group how effective, efficient, and satisfying defined goals can be reached.

3) Acceptability (or freedom from stigma and market acceptance) follows: Products should not define a person as disadvantaged because of their appearance (stigmatised). Products for disadvantaged groups of people should be designed in such a way as to make them acceptable to other users.

4) Joy of use (or aesthetics and emotionality) is the final goal: Products should not only be simple to operate and free from stigma, they should also satisfy the aesthetics needs of the user.”

These four guidelines are not far from the reviewed principles of UD for inclusion. They are based on the barrier-free concept, so that PwD access is guaranteed even in the most adverse scenario. The next step is usability, wherein the design is functional and not only responds to its intended use, but is even more importantly easy to use, i.e., it is user-friendly. Note that Iwarsson and Ståhl [2003: 62] also understand the correlation of these two levels in the same way: “Accessibility is a necessary precondition for usability (...). However, usability is not only based on compliance with official norms and standards; it is mainly subjective in nature (...). Usability is a measure of effectiveness, efficiency and satisfaction.” While the next two GRP levels can be summarised under aesthetics, meaning that the design cannot look awkward and generate stigma. Furthermore it must be pleasant to look and use. Indeed, Herwig [2008: 18] concludes: “To ensure its success, Universal Design must be attractive for everyone”.

Likewise, Kose [2011: 11.7-8] affirms that “good design is what is needed by the users, and there are six essential requirements –safety, accessibility, usability, affordability, sustainability, and aesthetics– to ‘good design’.” Whether it is called good design, design for quality of life, design for all, inclusive design, or universal design, their respective principles are always very close. In this case, three new keywords stand out in addition to the GRP principles described above: ‘safety’, ‘affordability’, and ‘sustainability’. Kose acknowledges the fact that not all requirements are enforceable, but “the first four requirements must be met to qualify for being called universal design”, and he concludes that “perhaps affordability is most crucial.” This observation is very relevant for inclusiveness, since it may be the reason for people choosing other designs over universally designed ones; if a design is too expensive, it will be rejected by the able-bodied community. The same rejection happens if the design is ugly, thus the aesthetic condition is quite crucial as well.

I will conclude by discussing one last criticism of the UD framework, one that concerns the lack of awareness of its social and political implications in architecture. While acknowledging the importance of UD in restoring PwD’s self-esteem, dignity and independence, Imrie and Hall [2004: 16] criticise its uselessness due to an absence of social and political perspective:

“However, it is difficult to see how far transformations in disabled people’s lives can occur without the development of a social or political programme for change and, in this respect, the core philosophies of universal design are unhelpful. Indeed, its principles are apolitical in that there is little or no recognition of the interrelationships between the social, technical, political and economic processes underpinning building and design.”

Knesl [1984: 9] goes so far as to suggest that “architecture is pre-determined by political and economic power, including laws, statutes, codes...” therefore, as Imrie [n.d.: 11] states, architecture practitioners

are “not able to influence, in any significant ways, the actions of regulators and the outcomes of regulatory activities.”

Therefore, if architects are so limited by legislation, how regulations are oriented and formulated makes a huge difference in determining the scope of accessibility for all. For instance, if accessibility requirements are only specified for the public sphere –such as in the USA, among many other countries– the options for easily finding an accessible home are very low. What is more, the possibilities of adapting an individual home can be very expensive and prohibitive. That is why it is so essential to enact one body of legislation that targets the whole built environment and the entire population. Consequently, accessibility is also a political question that not only needs to be promoted through legislation, but also within society, education and business.

Let us end with Iwarsson and Ståhl’s [2003: 61] suggestion that **UD is a vision to strive for rather than a feasible conclusive goal; in other words, UD is more about a process of changing attitudes throughout society than obtaining a definite result.** Likewise, this is the reason why Steinfeld and Tauke [2002: 187-188] prefer the term “universal designing, a verb rather than a noun, because the verb form puts the emphasis on going there, rather than getting there.”

A.3 Steps towards Universal Accessibility

To sum up, the most renowned and highly consulted standards are *The Principles of Universal Design* [Conell et al., 1997], which were redacted considering design in general, and are not particularly defined with the built environment in mind. In addition, they have received many criticisms and even been reviewed and addressed by some of the former authors.

Moreover, other institutions have described their own principles under different names, although quite synonymously, such as: *The Seven Principles of Good Design* [CABE, online] or *The Principles of Inclusive Design* [Fletcher, 2006: 7-15], both of which have been promoted by the Commission for Architecture and the Built Environment (CABE) in the UK; *The Principles of Design for All* [EuCAN, 2008: 14], promoted by the European Concept for Accessibility (ECA); or *The Universal Design India Principles* [Khare et al., 2011: 7-8], promoted by the National Institute of Design (NID) in India. However, they have not had much influence and, even though some of them have been exclusively defined with the built environment design in mind, they are quite unknown among many architecture practitioners. Nevertheless, new perspectives on the topic have been also disclosed, such as ideas of identity, aesthetics or economy, which are indeed relevant.

In conclusion, it is deemed necessary to include all the relevant understandings in one unique package that reviews and summarizes all the principles into one set of essential concepts, but which also particularly addresses built environment design so that it can be successfully communicated to the profession. The aim is to provide a greater understanding in accessible architecture thinking and to facilitate its logical implementation.

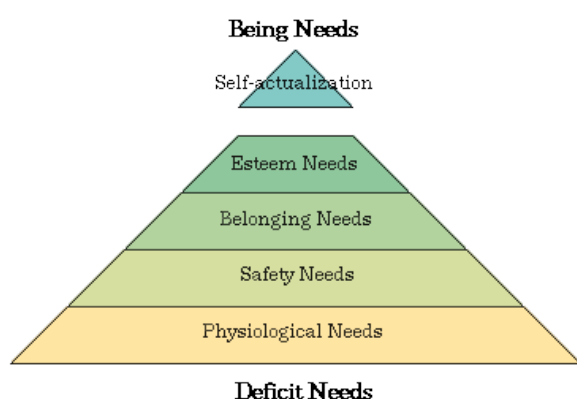
Furthermore, instead of providing a list of equally important requirements, the principles have been ordered into a set of steps or aims, according to their level of achievements, from the most basic to more existential goals. In other words, instead of providing independent and overly precise definitions of principles, which often lead to excluding ideas, these have been grouped into more encompassing terms that include all the needs for high quality accessible architectural design; i.e., they start with the most basic requirements for accessibility (barrier-free design, usability, safety, multisensory design), and continue on to higher levels of satisfaction (aesthetics, affordability, durability, cultural respect), which entail concepts of emotional wellness, self-esteem and social recognition.

This type of organization recalls Maslow's Hierarchy of Needs. According to Maslow [1954], people first need to fulfil basic needs before moving on to more advanced, existential needs; that is, you must satisfy the first level in order to move on to the next level of need. Maslow's hierarchy of needs has been largely analysed since its origins by both supporters as well as detractors. It was soon organized into two groupings: deficiency needs and growth needs. The deficiency needs are placed at the bottom, starting with physiological needs before moving on to the successive levels of safety, belonging and esteem. Growth needs are placed at the top of the pyramid, meaning self-actualization.

It is universally drawn in the form of a pyramid (see Fig.A.5 below), although Maslow himself

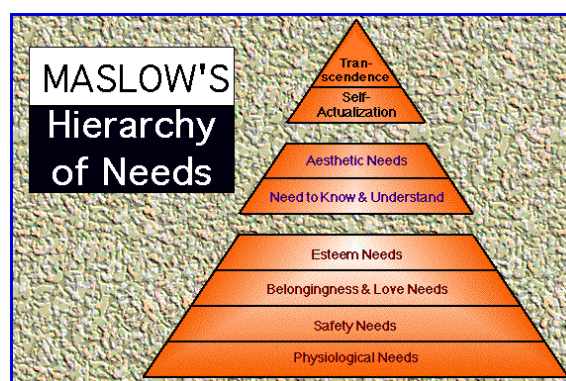
never used such a drawing in any of his texts. Its representation is so renowned that it is largely used in many publications and is considered to be part of the general knowledge archived in universal databases such as Wikimedia Commons. Later on, in the 1970s, Maslow rewrote an updated version of his hierarchy of needs, including cognitive and aesthetic needs [Maslow, 1970a], and transcendence needs [Maslow, 1970b]. The cognitive and aesthetic needs were considered the second new level between the first step of deficiency needs and the last level of growth. This in turn was complemented by the idea of transcendence, understood as helping others to achieve self-actualization [McLeod, 2007: online]. The illustration of this new understanding was soon reinterpreted in a pyramidal form of three main levels, an example of which can be seen in the Fig.A.6 illustration below:

Figure A.5: Exemplary illustration of Maslow's Hierarchy of Needs (1960s)



Source: [Boeree, 1998, 2006: online]

Figure A.6: Exemplary reinterpretation of Maslow's Hierarchy of Needs (1970s)



Source: [Huitt, 2011: online]

On the other hand, reviews and critical analyses have also been largely reported. According to Chapman [2005: 43], it is only necessary to concentrate on the higher levels concerning self-esteem and social recognition in developed countries nowadays:

“In the comfortable developed world, the satisfaction of physiological needs, and safety and security needs is practically a given. This concentrates remaining human need within the other three levels; therefore, developed world consumer motivation is primarily driven by social, ego and self-actualizing need.”

Similarly, in a recent publication arguing the importance of social interaction, Maslow's pyramidal form, which refers to a hierarchical order of needs, has also been put into discussion. According to Rutledge [2011: online], needs are not hierarchical but are an interactive, dynamic system, whose stability depends on our ability to connect with others. The author illustrates this comprehension in the form of interconnected levels or parallel steps, all of them necessary to arrive at the level of social connection (see Fig.A.7).

Figure A.7: Maslow's Model Rewired for Social Media

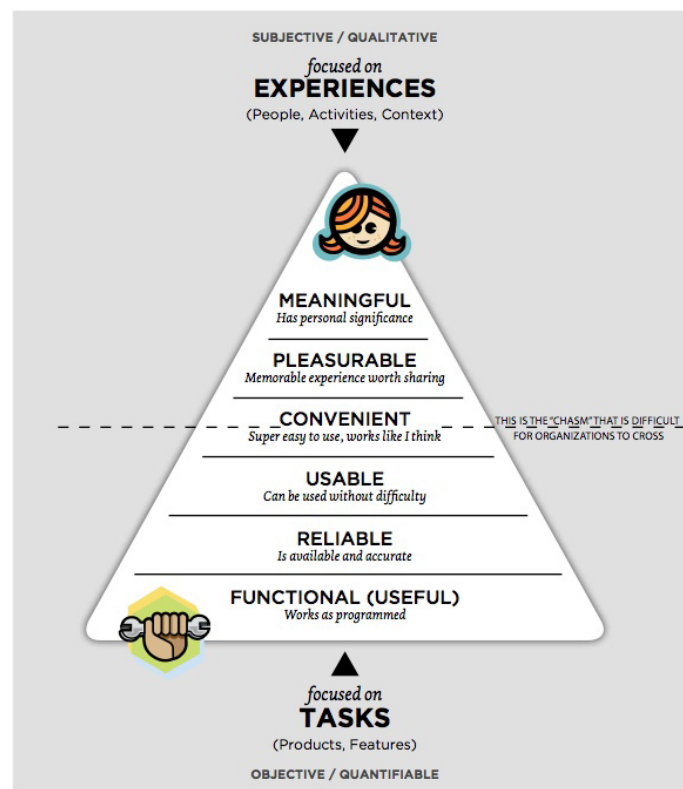


Source: [Rutledge, 2011: online]

Another review of Maslow's hierarchy of needs worth mentioning is the one proposed by Anderson [2011] in his book *Seductive Interaction Design*. Anderson addresses in particular technological products and service experiences; so he describes a new model of hierarchy of needs, now entitled "User Experience Hierarchy of Needs", which focuses especially on product design. The new model is based on six levels, and in the same way as Maslow's pyramid, the current level must be accomplished in order to move on to the next one. Passing through the levels is understood as a product maturity continuum, i.e., the 'functionality' level is placed at the bottom in order to finally reach the 'meaningful' level at the top.

Similarly to what happened with Maslow's Hierarchy of Needs, Anderson's has been also popularly reproduced and we can find several illustrations interpreting this new hierarchy (e.g., Fig.A.8 below). The most relevant aspect of this new pyramid to point out is that, at the bottom, the main focus is on the product, whether its usability and reliability is guaranteed or not. While at the top of the pyramid, the focus is on the people, whether the experience of people when interacting with the product is meaningful or not.

Figure A.8: Exemplary illustration of the "User Experience Hierarchy of Needs"



Source: <https://es.pinterest.com/pin/135530270007025037/>

Bringing all these considerations together, and putting them into the context of accessibility in the built environment, let us first consider:

Deficiency needs are the basic level placed at the bottom. This is considered to be practically a given in developed countries, so the important focus to concentrate on is the growth level, the meaningful level. When put into the context of the user and built environment design, the deficiency needs would be the user's **basic needs** to be met when in direct contact with the architectural environment. These are the fundamental requirements for the user's immediate satisfaction, embracing ideas of 'usability', 'safety', and 'flexibility'. The same as deficiency needs, these basic needs in architectural design are practically a given in current designs nowadays, every time more and more. Thus, the basic needs refer to the design's **normality condition**.

The growth level, in turn, is placed at the top of the pyramid because it is the hardest to achieve. It entails ideas of ‘perception’, ‘aesthetics’, ‘social recognition’ and ‘self-actualization’; that is, the needs that become meaningful in one’s life. In the present discussion, the growth or existential level refers to the idea of achieving ‘self-esteem’ and the sense of ‘belonging’ through design. It means feeling good in relation with your surroundings, so it relates to a larger scale, the environment-scale. It is concerned with how the user feels and cares about his/her surroundings, including both the built environment and its cohabitants, and with how meaningful the experience of the architectural environment becomes, in its broadest sense. Thus, some phenomenology thinking has been also applied, since we are “‘looking at’ architecture from within the consciousness experiencing it, through architectural feeling in contrast to analysis of the physical proportions and properties of the building or a stylistic frame of reference” [Pallasmaa, 1996: 450].

The **existential needs** in architectural design are placed at higher levels; they entail more elaborate requirements for the user’s holistic satisfaction, which are more rarely fulfilled in architectural design nowadays. It is not so much about the functionality of designs, but about the perception of designs, embracing ideas of durability, pleasantness and identity. They are necessary to ensure long-term relationships with our built environment; thus, they entail the design’s **sustainability condition**.

To sum up, the necessary steps for achieving an accessible built environment are considered to be all these listed concepts of ‘usability’, ‘flexibility’, ‘safety’, ‘perception’, ‘durability’, ‘pleasantness’ and ‘identity’, that is, an architectural environment that it is not only functional for its aim, but that also enriches our lives. The steps –let us call them the *Steps towards Universal Accessibility*– are organized on a scale of meaningfulness, starting from the most basic requirements to more existential goals.

Each of them has been defined based on the analysis of all the principles of UD / ID / DfA reviewed throughout this dissertation, with special reference to the previous *Tab.A.7: Comparison of Principles of UD / ID / DfA*. In other words, the process has consisted of building a new table, based on the previous Tab.A.7, where all the principles from each list (CUD’s, CABE’s, ECA’s and NID’s lists of principles, described in Chapter 2) are matched with each step for Universal Accessibility. On some occasions, the principles have been reorganized according to the new steps; on other occasions, especially in NID’s list, principles have been related to more than one concept. Following Tab.A.8 provides specific detail on the content of each step, from the most basic to the most meaningful steps:

Table A.8: Steps for Universal Accessibility / Architecture

| | Principles of UD [CUD] | Principles of Good Design [CABE] | Principles of ID [CABE bis] | Principles of DfA [ECA] | UD India Principles [NID] |
|--------|--|--|--|---|---------------------------------|
| useful | 7. Size and Space for Approach and Use <i>Design for any user’s body size, posture, or mobility.</i> | | | 4. Functional <i>The function intended should be carried out, without any problems or difficulties.</i> | |
| | | | 2. Responsive <i>Taking account of what people say they need and want.</i> | | |

| | Principles of UD [CUD] | Principles of Good Design [CABE] | Principles of ID [CABE bis] | Principles of DfA [ECA] | UD India Principles [NID] |
|-------------|--|---|---|--|--|
| flexible | 2. Flexibility in Use <i>Provide choice; adaptability.</i> | 7. Diversity <i>Places with variety and choice.</i> | 3. Flexible <i>Different people can use places in different ways.</i> 7. Realistic <i>Offering more than one solution to help balance everyone's needs and recognising that one solution may not work for all.</i> | | 1. Equitable (Saman) <i>Provide flexibility and customization; allow adjustable and adaptable options.</i> 5. Aesthetics (Sundar) <i>Allow personalizing aesthetics through flexibility, adaptability and modularity.</i> |
| | 5. Tolerance for Error <i>Minimise hazards; discourage tasks that require vigilance.</i> | | | 2. Safe <i>Free of risks to all users.</i> | 2. Usable (Sahaj) <i>Autonomous, comfortable, safe and supportive use; easy access and operation; minimize instructions and avoid confusion and error.</i> |
| safe | 6. Low Physical Effort <i>Minimise repetitive actions and fatigue; neutral body position.</i> | 4. Ease of movement <i>Places that are easy to get and move through, specially pedestrians.</i> | 4. Convenient <i>Everyone can use places without too much effort or separation.</i> | 3. Healthy <i>Not cause problems to those who suffer from certain illnesses or allergies.</i> | |
| | 3. Simple and Intuitive Use <i>Easy to understand and to use; eliminate complexity.</i> | | | 5. Comprehensible a) Clear information <i>Use of icons that are common to different countries.</i> | 2. Usable (Sahaj) <i>Build intuitive understanding.</i> 5. Aesthetics (Sundar) <i>Employ appearance to inform use and safety, and bridge meaning and comprehension gaps.</i> |
| | | 2. Continuity and enclosure <i>Clear distinction between public and private open spaces.</i> 5. Legibility <i>Places that are easy to locate and navigate.</i> | 8. Understandable <i>Everyone knows where they are and can locate their destination.</i> | 5. Comprehensible b) Spatial distribution <i>Coherent and functional, rather than segregating and exclusive.</i> | |
| perceptible | | | | | |
| | 4. Perceptible Information <i>Use different modes for presenting information; maximise legibility.</i> | | | | 2. Usable (Sahaj) <i>Multisensory feedback.</i> |

| | Principles of UD [CUD] | Principles of Good Design [CABE] | Principles of ID [CABE bis] | Principles of DfA [ECA] | UD India Principles [NID] |
|------------------|---|--|--|---|--|
| endurable | | 6. Adaptability <i>Places that can easily accommodate changes over time.</i> | | | 3. Cultural (Sanskritik) <i>Respond to local context and conditions.</i> 4. Economy (Sasta) <i>Ensure affordability, durability and maintainability; use local materials; modular approach to offer choice in features and price range.</i> |
| pleasant | 1. Equitable Use <i>Appealing to all users.</i> | 3. Quality of the public realm <i>Attractive and comfortable outdoor spaces.</i> | | | |
| | | | | 6. Aesthetic <i>Aesthetically pleasing; more likely to be accepted by everybody.</i> | 5. Aesthetics (Sundar) <i>Aesthetic design to enhance appeal and use.</i> |
| identity | | 1. Character <i>Identity; distinctive and memorable places.</i> | | | 3. Cultural (Sanskritik) <i>Respect social and traditional qualities in design.</i> |
| | 1. Equitable Use <i>Same means of use; avoid segregation.</i> | | 1. Inclusive <i>Everyone can use places safely, easily and with dignity.</i> 5. Accommodating <i>For all people, regardless of their age, gender, mobility, ethnicity or circumstances.</i> 6. Welcoming <i>With no disabling barriers that might exclude some people.</i> | 1. Respectful <i>Respect the diversity of users; nobody should feel marginalised.</i> | 1. Equitable (Saman) <i>Fair and non-discriminating to diverse users.</i> |

Source: Own elaboration

In addition, it is important to also consider Rutledge's [2011: online] observation about how the needs conform to an interactive, dynamic system rather than follow a hierarchical order.

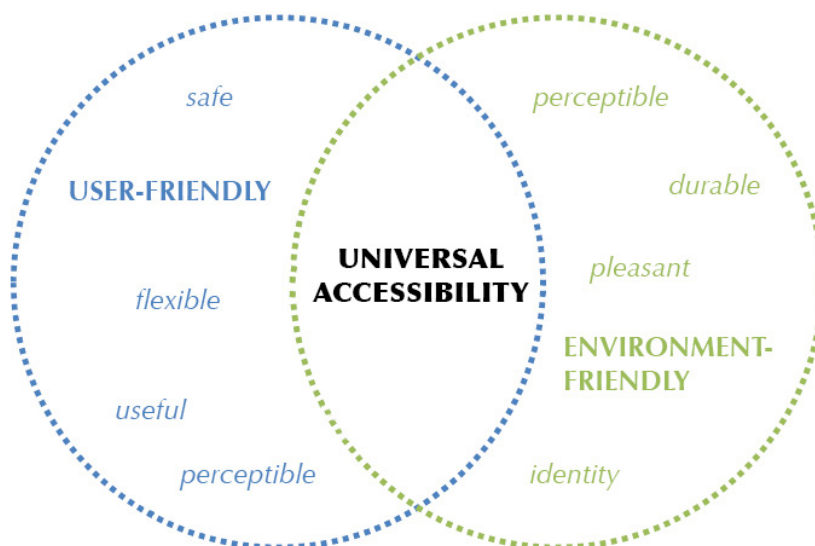
In the present discussion, although the series of *Steps towards Universal Accessibility*, just detailed above, have been listed from the most basic to the most meaningful, that does not contradict the fact that they interact simultaneously. The understanding is hierarchical in the sense that one step

is considered to provide a more existential satisfaction than others, but not in the sense that one step is necessary to be fulfilled before moving on towards the next one. In other words, all of them are equally necessary to fulfil our expectations from our surroundings, since we depend on our environment to be able to carry out all quotidian activities. Yet, we also depend on our environment to connect with others. We seek autonomy, social recognition, and meaningfulness in our lives.

However, the steps have been divided into two main groups: the basic level and the existential level. The basic level concerns the user, i.e., a design which is user friendly. The existential level concerns the user in a larger sense, in relation with his/her surroundings, i.e., a design which is environmentally friendly. The user-friendly level includes concepts of usefulness, flexibility, safety and perception. The environmentally-friendly level embraces the concepts of perception, durability, pleasantness and identity. Note that both levels share the step of ‘perception’, since it is precisely the one that builds the connection between the user and its surroundings: it refers to both how easy and intuitive the built environment is for the user, but also how the design of the built environment makes us feel, e.g., whether or not we are included or excluded, in the right place or lost.

In conclusion, that is why the representation of the *Steps towards Universal Accessibility* (see Fig.A.9 below) is not drawn as a pyramid shape, but as two interconnected circles. This is because it is believed to be a more accurate representation of how to advance towards inclusive environments. When advancing steps, the scope is not reduced, as it seems to happen in the pyramid figure where the top has less surface than the bottom. Neither one is indispensable for reaching the following one. On the contrary, all the steps are equally necessary (although not equally important in terms of existential satisfaction) for achieving *Universal Accessibility*.

Figure A.9: Steps for Universal Accessibility/Architecture



Source: [Own elaboration]

To sum up, the Steps towards Universal Accessibility is organized into two main levels, which must be progressively approached, and always with an empathic view:

On the one hand, the primary level of basic needs must ensure that all architecture is **user-friendly**:

In other words, spaces have to be **usable** for any intended user and must respect the diversity of body shapes and mobility capacities. To do this, **flexibility** is often essential, i.e., it should provide choices or adaptability options. Likewise, success depends fundamentally on taking into account what people say they need and want, i.e., the responsive character of the design. In addition, spaces must be **safe** and free of risks; they should support healthy use, and minimize physical effort or forced body positions, i.e., they should provide convenient, autonomous and comfortable use.

Furthermore, all architectural design must be **multisensory**; the ‘principle of two senses’ should be always followed, i.e., using different modes for communicating the information, so that perception is ensured through touching, hearing, smelling or seeing. The aim is to make sure that any intended user, regardless of their cognitive capacities, can easily navigate spaces. An intuitive spatial distribution and clear distinction between different types of spaces must be provided, so that everyone can orient him or herself and reach their destination.

In doing this, we are ensuring its **reliability** and its **communicability**.

On the other hand, the higher level of existential needs must ensure that all architecture is **environmentally friendly**: In other words, spaces must be **aesthetically pleasing**, so that they are more likely to be accepted by everybody and used over the long-term. In order to do this, the cultural context must be taken in to account, and the social characteristics and traditional resources must be respected so that spaces maintain their own identity and are economically viable. In addition, the **affordability**, **durability** and **maintainability** of designs must be ensured; and, for that, places should easily accommodate changes over time.

In doing this, we are ensuring its **sustainability** and its **durability** (also emotional).

In consequence, if we follow all these principles in an empathic way, the result will be **non-discriminating** spaces where nobody feels marginalized or stunned by the design. We will be ensuring its **equality**.

ANNEX B

PRM Surveys

B.1 Introduction

"Can it be that having others research on the lives of disabled people (rather than us expressing our own experience) has something to do with the very nature of disability? What, then, is disability?"
[Finkelstein, 1975: online]

This annex addresses the study based on surveys conducted among People with Reduced Mobility (PRM hereafter), under the principle of participatory and co-created research: the aim is to not carry out research *'on them'* but *'with them'*, a significant distinction that Edmonson and von Kondratowitz [2009] pointed out when investigating the elderly and ageing, a topic that can be easily extrapolated into this context.

PRM, the ultimate beneficiaries of accessible –often, merely barrier-free– environments are believed to be the pertinent interest group of study for gathering opinions and measuring satisfaction towards accessible design. We must be aware that people with disabilities, or with special needs, are a minority group of users often identified by themselves as disadvantaged in society due to discrimination in design [Disability Discrimination Act, 1995].

The objective is to explore the relation between discrimination and design as well as the relation between disability and architectural barriers. I also want to corroborate that disability is the result of the interaction between a person and his/her environment, as the United Nations [UN, 2007] defend. Thus the perception of disability is caused by the obstacles in the environment –either architectural or cultural barriers– and not so much by the person's own impairments. Consequently, the built environment with architectural barriers is the one to blame to a great extent in generating the sense of being disabled.

The questionnaires have been conceived as qualitative research on accessibility in architectural design, with the aim of exploring how the design of the built environment can affect the PRM's perception of wellbeing and happiness. It is important to highlight the fact that the survey is limited and asks specific questions only about certain issues, but does not give the whole picture of PwD and accessible design. The reason for this is because, at this point, the concern is to evidence the problem in the approach of accessibility codes and the resulting accessible design, yet not to solve them, which would require, of course, more extensive research.

The surveys were designed and launched internationally (from January to June 2013) via rehabilitation centres that have direct contact with the target users, and via social nets such as Facebook and mailing lists of different associations concerned with PwD. They were translated to several languages: English, Spanish, Catalan, Finnish, and Italian. The English sample of the survey can be consulted in the last section B.4)

The questionnaires were launched thanks to the free access of the online survey software WEBROPOL, which was facilitated by TUT. The WEBROPOL software also allows extracting statistics

and making customized reports for a deeper reading of the results; for instance, by filtering one question and conditioning it to a given answer of a second question. This tool has been used repeatedly to gain a deeper comprehension of the results arising from these questionnaires, which are presented in detail in the following section B.2 *PRM. Surveys analysis*.

Unfortunately, the most significant participation came only from Spain and Finland. Thus, a direct comparison between these two countries will be made in the reading of the results. Specifically, there were 75 Spanish respondents and 22 Finnish respondents; that is a total of 97 surveys were analysed. It is worth remembering that the respondents have answered voluntarily, noting that they were highly concerned with the topic and self-motivated to share their experiences. Consequently, extra effort for objectiveness is necessary since, on some occasions, over-motivated answers –especially those that denounce situations where they felt discriminated– have been recorded. Thus, they need to be somehow interpreted and their critical nature played down. In that respect, it is worth remembering as well that I am a wheelchair user myself, thus my fifteen years of experience ‘on wheels’ provides me with certain insights into the topic.

As often happens with qualitative research using a survey methodology, the more relevant information is the feedback obtained from the open-ended questions, where the respondents had the opportunity to express their particular concerns rather than simply agreeing or disagreeing on a specific question, which incidentally runs the risk of being influenced by some preconceived notions of the researcher. Therefore, all the replies from the open-ended questions are considered very valuable and have been translated into English from Spanish, Catalan or Finnish, depending on the source. It must be noted that, on some occasions, the translations are not literal, in order to ensure their comprehension by everyone and due to the habitual slang used by disabled groups and perhaps some other missing context taken for granted.

All the comments from each open-ended question have been analysed and processed looking for similarities, in such a way that they have been organised in several categories. In addition, some of the remarks given by the respondents were quite complete and regarded different issues. Thus, in such cases they have been divided according to the different concepts classified. The most significant remarks will be enclosed within the coming exposition in section B.2, while the complete list of the processed comments, organised in the several categories detected, together with their correspondent original versions as well as the full detail of the general statistics of the surveys and the intact open-ended answers can be consulted in the last section of this document, B4.

B.2 PRM surveys analysis

The survey was organised in three different parts:

- **A. General Data:** range of disability, age, sex, nationality, etc.
- **B. Regulations:** to learn about the user experience, satisfaction, and suggestions concerning accessibility regulations.
- **C. Perception:** to learn about how the design of the built environment may affect the user's self-esteem.

Therefore, section A compiles general information from the respondents, while sections B and C gather the answers about their experiences, attitudes or opinions on the present state of things, and how these could be improved. Sections B and C are mainly addressed with multiple-choice questions, but also with open-ended questions allowing the possibility to add remarks or suggestions.

Following this same structure, the 97 questionnaires (75 from Spain—mainly from Catalonia—and 22 from Finland) are analysed next, displaying the main results in tables and occasionally accompanied by photographs to illustrate and make more comprehensible the statements. Some tips on how to read the upcoming tables:

- The data obtained from the **Spanish respondents is displayed in red**, while blue is used for the Finns, for easier reading.
- (The total number of respondents and/or the partial number of respondents out of the total is displayed between brackets)
- The values are often expressed in approximate %, together with the corresponding real numbers of respondents out of the total.
- The results can also be valued on a scale of 1 to 5, where 5 corresponds to maximum agreement/satisfaction or disagreement/dissatisfaction, depending on the case; therefore 3 = pass.
- **The most significant results (generally being the greatest or lowest value) are highlighted in bold letters for greater comprehension.**

B.2.1 General data

An overview of the respondents' general data is presented in the following Tab.B.1:

Table B.1: Gender and age & Years and severity of the mobility impairment

| | GENDER | | AGE | | | | | |
|-----------|------------------------------|------------------------------|----------------------------|----------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| | Male | Female | <15 | 16-25 | 26-35 | 36-45 | 46-55 | >56 |
| Spaniards | 72% (54/75) | 28% (21/75) | 1% (1/75) | 3% (2/75) | 21% (16/75) | 27% (20/75) | 24% (18/75) | 24% (18/75) |

| | GENDER | | AGE | | | | | |
|-------|---------------|----------------|-----|---------------|---------------|---------------|---------------|--------------|
| Finns | 41% (9/22) | 59% (13/22) | - | 36% (8/22) | 27% (6/22) | 14% (3/22) | 18% (4/22) | 5% (1/22) |

| | YEARS OF MOBILITY IMPAIRMENT | | | | | | ABILITY TO STAND UP & MAKE FEW STEPS | |
|-----------|------------------------------|----------------|----------------|----------------|----------------|--------------|--------------------------------------|----------------|
| | Since birth | > 30 | >15 | >7 | <7 | <2 | Yes | No |
| Spaniards | 5% (4/75) | 15% (11/75) | 20% (15/75) | 32% (24/75) | 23% (17/75) | 5% (4/75) | 41% (31/75) | 59% (44/75) |
| Finns | 36% (8/22) | - | 9% (2/22) | 18% (4/22) | 32% (7/22) | 5% (1/22) | 55% (12/22) | 45% (10/22) |

Source: Own elaboration based on PRM surveys

After reading the tables, the assumption is that most of the Spanish respondents were more likely mobility impaired as a result of an accident (note that they were generally in their thirties or older, and had been mobility impaired for 5-15 years), while in the case of most Finns the mobility impairments were more likely the result of a congenital and/or neurological disease (note that many of them had been impaired since birth). Also in relation to this data, many Finns stated they are able to make a few steps while the Spaniards did not, since accidents often turn out to be complete permanent spinal cord injuries, while congenital diseases are often other kinds of neurological disorders that allow partial movement. Consequently, almost 75% of the Spaniards stated that they did not have any other kind of impairment besides mobility, while 50% of the Finns also acknowledged other sensory and/or cognitive impairments.

Both Spanish and Finnish respondents mostly had a University degree or at least a higher school education. Also, respondents were asked about any professional background in design or architecture disciplines –data believed relevant in relation to the questions concerning accessibility regulations– and both Spaniards and Finns mostly claimed that they did not. Finally, question *A.4 Which is your percentage of disability officially recognised?* has been discarded in the reading of results, since an official percentage is indeed given in Spain by governmental institutions when evaluating the grade of disability, whereas this is not the case in Finland.

B.2.2 Regulations

Concerning accessibility standards, when asking if the user was familiar with them, was satisfied, and whether they would add or change anything, the general responses indicated that, although people do not exactly know the specifics of the regulations, they were mostly not satisfied and would suggest changes. Therefore, in general terms, PRM feel discontentment towards accessible built solutions; whether it is direct dissatisfaction towards regulations or towards the vague implementation of them depends on the context and the respondent. In the following Tab.B.2, the specific results are displayed:

Table B.2: Feedback about accessibility regulations

| ARE YOU FAMILIAR WITH REGULATIONS ON ARCHITECTURAL BARRIERS (ACCESSIBILITY)? | | | | | |
|--|---|------|---|---|---|
| | Rarely / never.....Continually / always | | | | |
| Spaniards (75) | 1 | 2.71 | 3 | 4 | 5 |
| Finns (22) | 1 | 2.27 | 3 | 4 | 5 |

| ARE YOU SATISFIED WITH THEM? | | | | | |
|---|---|------|---|---|---|
| Rarely / never.....Continually / always | | | | | |
| Spaniards (75) | 1 | 2.27 | 3 | 4 | 5 |
| Finns (22) | 1 | 2.59 | 3 | 4 | 5 |

| WOULD YOU ADD ANYTHING TO THEM? | | |
|---------------------------------|-------------|-------------|
| | No | Yes |
| Spaniards (75) | 20% (15/75) | 80% (60/75) |
| Finns (22) | 41% (9/22) | 59% (13/22) |

Source: Own elaboration based on PRM surveys

In fact, ‘*Would you add anything to them [accessibility regulations]?*’ was the open-ended question that received more comments in general, with a total of 55 answers among the Spanish participants, and 10 from the Finnish respondents. After processing it, looking for similarities and organising it in different categories, the result has been a total of 78 comments classified in 4 main categories, with corresponding subcategories when pertinent. In order to visualise which categories have received the largest number of comments, which often translates into a major concern or discontent, the following Tab.B.3 is provided:

Table B.3: Feedback for improving accessibility regulations

| Comments to: 'WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?' | | | |
|---|--|---|----------------|
| Different categories identified | | | N° of comments |
| 1) On general implementation | 1a) On the mandatory nature of regulations, its control and punishment | 6 | 21 |
| | 1b) On the general customary poor implementation | 8 | |
| | 1c) About how to approach accessibility | 7 | |
| 2) On demanding greater accessibility | 2a) In new public buildings | 4 | 27 |
| | 2b) In existing public buildings | 9 | |
| | 2c) In public spaces | 7 | |
| | 2d) In transportation (public transport and private vehicles) | 7 | |
| 3) Specific complaints | 3a) Disagreement with regulations | 5 | 22 |
| | 3b) About ramps too steep | 8 | |
| | 3c) About public toilets | 7 | |
| | 3d) About hotels | 2 | |
| 4) Others | Ethics, awareness, reflections... | | 8 |
| TOTAL | | | 78 |

Source: Own elaboration based on PRM surveys

One of the most repeated reproaches has been the lack of greater accessibility, repeatedly denouncing poor implementation of the accessibility standards. There were also desires expressed about how regulations must be compulsory and that there should be more inspections, that they should be stricter, and that there should be fines if the requirements are not properly fulfilled. It is worth mentioning the several statements received concerning how to approach the topic: respondents have shown their general discontent towards current accessibility and have given some hints on how to ensure real accessible environments, such as ‘*sit architects in a wheelchair, then they would handle buildings and adaptations properly*’, or ‘*explain, teach the designers that accessibility is not about installing a handle in a bathroom; accessibility is the study of the space to make it more comfortable*’. Thus, according

to the respondents, a lack of relationship between designers and users is evident, and the advice from the target group must be sought further. In other words, co-designing processes, which allows higher participation and sharing of experiences between users and designers, is what accessible design needs.

Some of the Finnish respondents acknowledged their relative ignorance related to accessibility standards, but assumed that the results would be better if they were correctly implemented: ‘**I am not sufficiently familiar with the regulations to make suggestions. I assume that the settings are sufficient but, based on my practical experience, the implementation is weak and lacking common sense.**’ Instead, the Spanish respondents demonstrated better knowledge of the regulations with specific criticisms concerning particular issues, especially the presence of isolated steps: The Catalan accessibility standards *Codi d’Accessibilitat de Catalunya* –redacted in 1995 and with a promised imminent update– allows having a step no higher than 12cm in residential buildings where the installation of a lift is compulsory [Catalunya, Departament de Benestar Social, 1995: Annex 2, Article 2.2]. This inevitably translates into many shops and businesses having this permitted step as well. The discontent of the users has been noted several times, as its removal becomes an indispensable factor in avoiding dependency: ‘**Accesses must be at the same level, 12cm steps are unacceptable since they are impractical to autonomy**’, was the criticism of one respondent. This fact translates into disabled users being restricted to determined spaces and not enjoying the city as a whole, as the following complaints show: ‘**I can only go shopping in new commercial centres**’, also formulated similarly as ‘**access to routine shops and not only multinational businesses must be more accessible.**’

These complaints can be linked to the complication of implementing accessibility requirements in existing buildings and the conflictive dispute between accessibility and heritage (a topic that has been further researched in case study LOCUS IP). Users demand more barrier-free entrances and lifts in old buildings and, more importantly, within a window of time. Some respondents have also provided specific examples where the public administration promises to remove architectural barriers that have fallen into oblivion: ‘**Public spaces must be barrier-free. In Seinäjoki, my city, I do not have the opportunity to visit the movie theatre because of the spiral staircase. Its adaptation has been promised, but just at the speech level.**’

Indeed a great number of complaints regarding the public realm have been compiled, whether concerning public buildings, urban public spaces, or public transportation. This fact was already expected, since outdoor accessibility is always the most difficult to accommodate, due in part to the great diversity of the countless users that may occupy a public space. In contrast, everyone in the private realm can arrange their own space according to their specific needs, which allows greater flexibility and more precise solutions.

Basically, the great number of the respondents’ protestations about the public space can be synthesised into the two following comments: ‘**Forcing adaptation of sidewalks and bathrooms**’, and ‘**parking zones, more accessibility in the metro**’. The first comment is worth being noted because there have been so many similar remarks on these topics. That this is why, within the category 3) *Specific complaints*, rebukes on ramps being too steep and on public toilets have been labelled in their own subcategory. To summarise, it is fundamental that PRM not have steps in their path that are isolated or uneven, that ramps are not too steep, and that accessible toilets are available throughout their journeys. Furthermore, accessible public transportation and sufficient number of accessible parking spots must be ensured.

As a matter of fact, the design of accessible toilets was expected to be a conflictive issue to face, and this is why the questionnaire had several questions concerning this particular subject:

B.2.2.1. Design of accessible public toilets

First of all, let's see the general results that evaluate the difficulty or ease of finding and using an accessible toilet (see Tab.B.4):

Table B.4: Enquiries on availability and usability of accessible public toilets

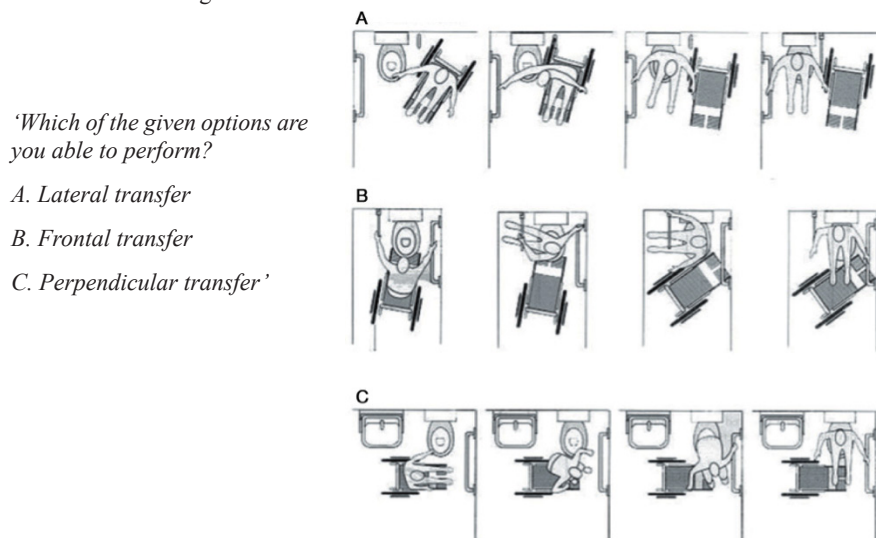
| DO YOU USUALLY HAVE PROBLEMS FINDING AN ACCESSIBLE SANITARY FACILITY? | | | | | |
|---|---------------------|------|------|----------------------|---|
| | Rarely / never..... | | | Continually / always | |
| Spaniards (75) | 1 | 2 | 3.05 | 4 | 5 |
| Finns (22) | 1 | 2 | 3 | 4 | 5 |
| CAN YOU NORMALLY USE SANITARY FACILITIES FOR THE DISABLED WITH COMFORT? | | | | | |
| | Rarely / never..... | | | Continually / always | |
| Spaniards (75) | 1 | 2 | 3.09 | 4 | 5 |
| Finns (22) | 1 | 2.77 | 3 | 4 | 5 |

Source: Own elaboration based on PRM surveys

As the reader can see, the respondents barely approved the easiness of finding and using an accessible toilet. The Finns' were more greatly dissatisfied with being able to use the sanitary facilities at an acceptable level of comfort. An attempt at reasoning this disapproval will be made later on, when analysing the corresponding open-ended questions of this section.

I aimed at a more specific examination of how a person transfers from the wheelchair to the toilet seat, especially taking into account those users who are not able to stand up and/or make a single step and thus need to transfer to the toilet seat to satisfy their physiological needs (instead of using urine collecting bags or diapers, for instance). Regarding the dimensions necessary to ensure that somebody is able to transfer from his/her wheelchair to the toilet seat, the regulations demand a lateral space free of obstacles measured in 80cm width minimum. My personal experience –as a wheelchair-user myself and in these specific circumstances– tells me that this is not accurately correct, because placing the wheelchair absolutely parallel to the toilet seat would involve jumping a bit over the wheel, which is obviously nearly impossible for many users. As that is my personal opinion, and how people manage to satisfy their physiological needs is quite a taboo topic, the research wanted to provide evidence of this fact by anonymously asking the users about their personal practice. Therefore, the following multiple-choice question, with attached drawing (see Fig.B.1), was addressed:

Figure B.1: Illustrations of the wheelchair-toilet transfer



Source: Adapted from Minusval2000 [online]

I must admit that the results have not been as expected, probably due to an imprecision of the drawing, which was intended to facilitate the comprehension of the question. It may have ended up being too subconsciously influential: As the reader can see, in the option *a) Lateral transfer*, the wheelchair is not absolutely parallel to the toilet seat, especially in the first drawing at the left of the sequence. Nevertheless, that would also mean that the 80cm next to the toilet required by the regulations is equivalent to the wheelchair's width (the considered standard wheelchair), which is incorrect because the space should be measured considering the oblique position of the user. The option *b) Frontal transfer* was expected to be the one with fewer points because it requires almost a 180° body turn, which can be quite complicated for many users; while the option *c) Perpendicular transfer* is the one that allows the wheelchair seat to be closest to the toilet seat and should therefore be easier. In these two last suppositions, again, the drawings may not be precise enough because, in case b), the wheelchair ends up being drawn in an oblique position once again, especially in the last illustrations of the movement sequence on the right. While in case c), the presence of the sink (which, as a matter of fact, is the only case in which it was illustrated) seems to be interfering with the space; so it may also have somehow influenced the results.

First of all, let's review the already analysed previous questions concerning the level of difficulty in finding and using an accessible toilet, but by filtering the results and only retrieving the answers from the current target group: the people who cannot stand up and need to transfer from the wheelchair to the toilet seat to satisfy their physiological needs. That is, 33 users out of the total 75 Spanish respondents, and 5 users out of the total 22 Finnish respondents. Tab.B.5 below presents the new results and compares them with the former ones (which refer to the whole spectrum of respondents and are in grey in the table):

Table B.5: Enquiries on availability and usability of accessible public toilets (bis)

| DO YOU USUALLY HAVE PROBLEMS FINDING AN ACCESSIBLE SANITARY FACILITY? (Or one that you can use) | | | | | |
|--|---|------|------|---|---|
| Rarely / never.....Continually / always | | | | | |
| Spaniards (33/75) | 1 | 2 | 3.48 | 4 | 5 |
| Spaniards (75) | 1 | 2 | 3.05 | 4 | 5 |
| Finns (5/22) | 1 | 2 | 3.08 | 4 | 5 |
| Finns (22) | 1 | 2 | 3 | 4 | 5 |
| CAN YOU NORMALLY USE SANITARY FACILITIES FOR THE DISABLED WITH COMFORT? | | | | | |
| Rarely / never.....Continually / always | | | | | |
| Spaniards (33/75) | 1 | 2.7 | 3 | 4 | 5 |
| Spaniards (75) | 1 | 2 | 3.09 | 4 | 5 |
| Finns (5/22) | 1 | 2.2 | 3 | 4 | 5 |
| Finns (22) | 1 | 2.77 | 3 | 4 | 5 |

Source: Own elaboration based on PRM surveys

Therefore, for both countries the results have gotten worse: finding a proper toilet is consistently more difficult and, in addition, less likely to be used comfortably.

Now let us proceed with the specific questions about transferring from the wheelchair to the toilet seat. Firstly, it is worth pointing out that two similar but different questions have been addressed, in order to get a broader understanding. Furthermore, the statistics on people who cannot stand up have been compared with the general ones (respondents who need to transfer to the toilet, which is the aim of the present learning but also includes those who are able to stand up, identified as 'EVERYONE transferring' in the following Tab.B.6). The results are:

Table B.6: Enquiries on the transfer wheelchair-toilet

| WHICH OF THE FOLLOWING ARE YOU ABLE TO PERFORM? (You can tick more than one) | | | | | | | | |
|--|------------------------------|------------|----------------------------|------------|-----------------------------|------------|----------------------------|------------|
| | Spanish respondents | | | | Finnish respondents | | | |
| | NOT able to STAND UP (33/44) | | EVERYONE transferring (44) | | NOT able to STAND UP (5/14) | | EVERYONE transferring (14) | |
| | % | Real value | % | Real value | % | Real value | % | Real value |
| a) Lateral transfer | 75% | 24/33 | 67% | 29/44 | 60% | 3/5 | 50% | 7/14 |
| b) Frontal transfer | 18% | 6/33 | 25% | 11/44 | 60% | 3/5 | 63% | 9/14 |
| c) Perpendicular transfer | 58% | 19/33 | 64% | 28/44 | 80% | 4/5 | 72% | 10/14 |

Source: Own elaboration based on PRM surveys

The reading of the statistics is quite confusing and becomes unrealistic when trying to extract a pattern: On the one hand, in the case of the Spaniard respondents, lateral and perpendicular transfers are clearly the most valued, with frontal transfer being the least valued. The tiebreaker for the almost equal lateral-perpendicular result can be found when reading the answers retrieved from people who are not able to stand up: the scores diverge and the lateral transfer becomes the most preferred action. On the other hand, the Finnish results manifestly show that the perpendicular transfer is the most likely to be performed, while the least valued is the lateral transfer, though it is not far from the frontal transfer possibility. In this case, the low number of respondents makes it even more difficult to draw valid conclusions.

A second related question was addressed to this particular survey group. It is worth noting that, while in the previous enquiry the respondents could select more than one choice, in this case they were expected to order the options in a level of difficulty scale. The results are displayed in Tab.B.7:

Table B.7: Enquiries on the transfer wheelchair-toilet (bis)

| WHICH OF THE FOLLOWING IS EASIER FOR YOU? | | | | | | |
|---|-----------------------------------|---|-------------|-------------|-------------|---|
| Easiest.....Hardest | | | | | | |
| a) Lateral transfer | Spaniards - NOT STANDING (33/44) | 1 | 2.61 | 3 | 4 | 5 |
| | Finns - NOT STANDING (5/14) | 1 | 2 | 3 | 4.2 | 5 |
| | Spaniards - ALL TRANSFERRING (44) | 1 | 2.75 | 3 | 4 | 5 |
| | Finns - ALL TRANSFERRING (14) | 1 | 2 | 3.6 | 4 | 5 |
| b) Frontal transfer | Spaniards - NOT STANDING (33/44) | 1 | 2 | 3 | 4.06 | 5 |
| | Finns - NOT STANDING (5/14) | 1 | 2.6 | 3 | 4 | 5 |
| | Spaniards - ALL TRANSFERRING (44) | 1 | 2 | 3.68 | 4 | 5 |
| | Finns - ALL TRANSFERRING (14) | 1 | 2.5 | 3 | 4 | 5 |
| c) Perpendicular transfer | Spaniards - NOT STANDING (33/44) | 1 | 2 | 3.12 | 4 | 5 |
| | Finns - NOT STANDING (5/14) | 1 | 2.6 | 3 | 4 | 5 |
| | Spaniards - ALL TRANSFERRING (44) | 1 | 2 | 3.02 | 4 | 5 |
| | Finns - ALL TRANSFERRING (14) | 1 | 2.36 | 3 | 4 | 5 |

Source: Own elaboration based on PRM surveys

The results of this inquiry almost match perfectly with the previous ones: For the Spaniards, the lateral transfer is the easiest to perform, while the frontal approach to the toilet is the most difficult one, as was also estimated in the previous question analysis. Instead, the easiest action for the Finns is the perpendicular transfer, as also stated in the previous question. On the other hand, the hardest one, with a notable difference in score for this cross-examination, is the frontal transfer. Thus, there is yet another evident discrepancy between the Spanish and Finnish respondents; thus it is not possible to predict a pattern and translate it into architectural terms. However, as already stated in the objectives of

the present case study, this research aims only to evidence some incongruous points of the accessibility codes, but not to provide a solution for them. In an attempt to draw a feasible conclusion: the diversity of users can have the same diversity of movements for reaching their needs; and the nature of these movements could also be a consequence, for instance, of how the users were taught in the hospital after contracting their mobility impairment. A further, more precise and exhaustive study would be necessary in order to better understand the movements of a person in a wheelchair.

To conclude this section concerning the design of accessible sanitary facilities, a review of the most remarkable comments obtained from the open-ended question ‘*Would you like to add something about the design of accessible sanitary facilities?*’ will be presented. Again, after processing the commentaries and looking for similarities, the original 36 answers among the Spanish participants and 15 from the Finnish respondents have been subdivided when pertinent, and organised in different categories. The result has been a total of 73 comments classified in 4 categories, with their respective subcategories. It is worth remembering that the complete list of the processed comments within each category, as well as the intact open-ended answers, can be consulted in the last section of this *Annex B. PRM Survey*. Following, Tab.B.8 shows the main distribution of comments received within each category:

Table B.8: Feedback for improving accessible public toilet design

| Comments to: 'WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES?' | | | |
|--|---|----|----------------|
| Different categories identified | | | N° of comments |
| 1) On toilet complements | 1a) General complements | 12 | 37 |
| | 1b) Grab bars | 8 | |
| | 1c) WC lifter / WC height | 8 | |
| | 1d) Toilet paper / Bidet location | 9 | |
| 2) On general design | 2a) About space | 4 | 12 |
| | 2b) About showers and changing rooms | 2 | |
| | 2c) About doors and thresholds | 3 | |
| | 2d) General design approach | 3 | |
| 3) On general management | 3a) About how toilets are closed by key and/or used as storage room | 10 | 17 |
| | 3b) About safety, maintenance, and hygiene | 7 | |
| 4) Others | Ethics, awareness, reflections... | | 7 |
| TOTAL | | | 73 |

Source: Own elaboration based on PRM surveys

First of all, an implicit denunciation of how poorly implemented the accessibility standards are can be easily perceived just by looking at the many criticisms received regarding the excessive height of the complements installed in sanitary facilities (the soap dispenser, the automatic dryer or hand towels, the clothes hooks, the mirror, etc.); yet the regulations for both the Spanish and Finnish standards expressly specify the maximum height that is allowed and suitable for wheelchair users. Therefore, according to the respondents’ experiences, their comments can be understood as proof that accessibility standards are wrongly implemented. In this respect, it is also necessary to consider that the installation of complements, especially in already existing buildings, is often not the direct responsibility of the architect; rather, it is the maintenance staff of the building who usually deals with these issues.

It is worth pointing out that some of the subcategories of comments in the previous table were created from complaints received from one country or another. In other words, depending on the country of origin, a fact that may be due to several circumstances, i.e., differing accessibility standards or building

traditions, distinct usage habits for cultural reasons, etc. For instance, in the Spanish scenario, several remarks have been noted on accessible toilets customarily locked by key, which does not happen in the Finnish context. Similarly, for the Finns, doors with thresholds are a major issue, which are elements that are in contrast practically inexistent in Spanish constructions. Likewise, Spanish respondents report that the location of the grab bars is often deficient, while the grab bars are often part of the toilet unit in Finnish designs, thus its location is always convenient, albeit it can entail other problems such as the location of the toilet paper. All these examples will be explained in more detail next.

The wrong use and location of accessible sanitary facilities can become a notable problem in Spain. According to the Spaniards, they are most likely to find the accessible toilet locked by key –often with no information regarding where to go to find the key or whoever is in charge of opening it– thus, the user has to go back to the entrance point to seek a solution. On some occasions, even, the place where the key can be found is closed due to limited opening schedules, while the other public toilets remain open to the general public, which thus leads to a discriminatory situation. This is the case for the public toilets available in the seaside promenade in Barcelona, as the following sequence of images illustrate in Fig.B.2:

Figure B.2: Problem of accessible public toilets locked by key, not being able to access



Source: Passeig de la Barceloneta, Barcelona, Spain. [Own material]

It is important to remember that accessible facilities are often destined for people who have difficulties in moving around; therefore, it is normal that many respondents have complained about this particular fact. Furthermore, the problem does not only lie in finding the key, but in these cases they are also frequently used ‘as storage rooms full of the most varied objects’ by the staff (as illustrated in Fig.B.3 below). This obviously hinders PRM mobility even more. Some other complaints have been

noted on their location as being ‘**completely separated from the rest**’, disapproving the segregation that it generates.

Figure B.3: Problem of accessible public toilets locked by key, used as storage rooms



Source: *La Central* bookstore (left), *Les quinze nits* restaurant (right); Barcelona, Spain. [Own material]

Interestingly, not all the comments have been reproaches. Some have also provided constructive ideas, such as:

‘In the design of accessible toilets, it is better to integrate them with the rest and not to have them segregated and locked by key (they become a cleaning storeroom filled with junk); it is best if they are together with those of other people, to facilitate integration at all levels. Secondly, the sign should say “priority to the disabled” and thus not exclude others who want to use them too, but they must be aware to give priority if someone with a wheelchair or with crutches needs to use it.’

‘It would be very interesting to introduce in Spain and in other European countries the Eurokey, an initiative that has been used for years in Germany, Austria and Switzerland to ensure hygiene and the proper use of public toilets (also for those public toilets within a private institution). It is a key that any person who proves his/her disability may acquire and with it –once established and extended– he/she can use any public service without finding it messy or having to ask somebody to open it.’

Indeed, these last comments open the debate on why accessible toilets should be locked by key. Is it so that only people with mobility impairment are entitled to use them? A discrepancy of ideas among the respondents has been noted, but the primary reason for locking accessible toilets seems to be to avoid a lack of hygiene. This is important, especially because a wheelchair user must sit on the toilet seat, not like the able-bodied who can manage to urinate without touching the toilet seat if it is too dirty. Why this problem of toilets locked by key is not a major issue in Finland would require further research, but most likely it is due to a lower population density and cultural reasons.

In contrast, the Finns have also complained about a particular fact that does not exist in the Spanish scenario: the thresholds. ‘**We should also think about the doors and thresholds, and not just toilets**’, was the statement of one of the respondents. Indeed, the issue is so relevant that I have labelled it as a category of its own. A threshold –also called doorsill– is the horizontal piece (often wooden or metallic) forming the bottom of a doorframe. This element means an unevenness of about 2-4cm, and consequently it can hinder considerably the mobility of wheelchair users.

While indoor thresholds practically do not exist in Spain (only occasionally found, made of stone, in the main entrances of old country houses or mansion houses in the city), thresholds are indeed customarily found in Finnish surroundings. In existing constructions, these are placed almost in every door (as Fig.B.4 below illustrates), while in newer buildings, thresholds have practically disappeared from most doors, although many of them are often still present in the bathroom door and the main entrance door of the house. It is proper to address the question why thresholds are still used if they become a problem for some users and their removal is not harmful to anybody. The reason could

be because it is cheaper to have thresholds in order to better fulfil the fireproof and sound insulation requirements of Finnish regulations. Or it could be that there are not enough good doors without thresholds on the Finnish market. Also, it could be that, despite the architect's design, the builder selects different products. Or it could simply be that we tend to get attached to old beliefs; a traditional way of doing things can end up as the 'right' way of doing it, without thinking about it any further.

Figure B.4: Thresholds in every room



Source: Hotel Rantasipi, Jyväskylä, Finland. [Own material]

To conclude, let us introduce some of the basics concerning the grab bars, elements that are necessary to provide hand support for whoever is using the toilet, but especially for disabled users. They must be at both sides of the toilet seat at a reachable distance. Neither the Catalan nor the Finnish standards specify this distance, but it must equal an arm in a neutral position (without stretching the arm). Having grab bars at both sides is especially useful for somebody able to walk but with mobility and balance difficulties, in order to provide the support needed and assist him/her to stand up (just like the arms of a chair are used, simply picture somebody getting up from an armchair). On the other hand, somebody using a wheelchair only needs one grab bar, the one at the opposite side from where the wheelchair-toilet transfer is made; this is why the grab bars must be hinged, so they can be removed if necessary.

Having cleared up this point, the problem then lies in finding grab bars that are not hinged and/or wrongly placed (see next Fig.B.5), which become useless for many PRM. There may also be a problem with the quality and maintenance of the hinges, since many of them are in poor condition, as has been expressed by many of the respondents: '**Removing the grab bar from where we place the wheelchair bothers me a lot**'; '**Decent grab bars (some do not stay up and fall over, or are otherwise in poor condition)!**'; '**The grab bars are placed at 1m distance or in such a way that they end up being useless**'.

Figure B.5: Problem of grab bars wrongly installed



Source: VIPS restaurant, Zaragoza, Spain (left), Las Americas International Airport, Santo Domingo (right). [Own material]

In contrast, the Finns have complained not so much about the position of the grab bars, but about the difficulty of reaching the toilet paper, and this may be the reason why the statistics of the previously examined question ‘*Can you normally use sanitary facilities for the disabled with comfort?*’ had worse results among the Finnish respondents. The most likely reason for the problem of reaching the toilet paper is because the Finnish standards demand that the 80cm clear space to facilitate the transfer wheelchair-toilet must be on both sides, and also the toilet must be separated from the wall by 30cm. Consequently, the lateral walls are always at 80cm distance minimum, so the grab bars cannot be installed there, nor in the rear wall 30cm away. As a result, the customary Finnish design for the accessible toilet has grab bars integrated in the same unit or next to it, as the following Fig.B.6 illustrates:

Figure B.6: Finnish design of accessible toilet with grab bars integrated



Source: Sokos, Tampere, Finland (left); Valintatalo, Rauma, Finland (right). [Own material]

The problem lies in the fact that the wall is the normal place where the toilet paper is installed and it is too far away, as many respondents complain: ‘*The toilet paper should be closer to the toilet, so that it is not necessary to stretch, because for some it is impossible*’; ‘*The toilet paper within hand’s reach!*’ To compensate this problem, new grab bars have been designed in such way that a device for putting a roll of toilet paper is integrated into the grab bar itself (see next Fig.B.7). Also, in Finnish culture, toilets are also provided with bidet showers, and their location is frequently deficient: ‘*The handle of the bidet shower should be designed so that it is not necessary to stretch the hose, it should be within hand’s reach when in the sitting position, and it should not be necessary to rise*’. Nevertheless, the problem often remains because the toilet paper easily falls when the grab bar is folded up. Furthermore, the toilet paper dispenser is often also installed on the wall, and it could be that the cleaning staff forgets to replace the toilet paper in both places. The same happens with the bidet shower, which can be relocated by cleaning staff or some other users to the wrong position.

Figure B.7: Finnish design of accessible toilet with grab bars integrated (bis)



Source: Helsinki Airport, Finland. [Own material]

In summary, the functionality of accessible sanitary facilities is questioned by many PRM, and it is most likely an international concern, since we can find different designs in different places of the world with questionable results. As stated by one respondent: ‘**I would especially like to see unified regulations (to prevent having one for each country, region, city, etc.) so that it is ensured that, when we say “something is accessible,” everyone understands the same thing without need to specify.**’ Indeed, different designs can be found around the globe (see some examples in Fig.B.8 below), and their more or less suitability should be ideally examined and compared in a cooperative learning environment for universal, inclusive design.

Figure B.8: Other international examples of accessible sanitary facilities



Source: Vasa Museum, Stockholm, Sweden (left); Saachi Gallery, London, UK. [Own material]

B.2.3 Perception

The last part of the survey was aimed at valuing the level of satisfaction towards accessible environments and, more importantly, how it affects daily activities and the user's self-esteem.

Firstly, the users were asked about their level of satisfaction with their current home, with an option to add comments as an open-ended question. They were also asked if they had to move or not to a more accessible new place after contracting their disability. For both countries the answer has been about 75% satisfied, compared to 25% not satisfied. In the comments about not being satisfied, the respondents complained basically about the difficulties in getting into the shower and operating in the kitchen, but also about the poor accessibility of the building's common areas: the lack of a lift or the cabin was too small, doors were too heavy or ramps too steep, among others.

Concerning the respondents who described having trouble accessing the shower or bathtub, it is worth noting that this was a general reproach among the Spaniards but not the Finns. The reason for this is because the customary Finnish housing design resolves the bathroom in such way that it is already accessible since there is no shower base, but the shower floor is the same as the bathroom floor, so there are no steps or shower enclosures to deal with.

What is more, the primary interest about the obtained comments pertains to filtering out those who were not satisfied and who had moved to a new place. As stated by some of the respondents, some who were not satisfied had not moved to a more accessible place merely because they could not afford it. But those who had moved to a different place seeking more accessibility but were still not satisfied had usually moved to newer constructions where accessibility should have been ensured. Therefore, reading these observations carefully provides relevant information:

‘The interior of my house is all right but the accessibility in the building is relative. It was built in 2000 and therefore meets (or should meet) the standards currently in force. You might say that it is accessible, but it does not seem right to me that to access my block I have to enter through the community garden because there are 6 stairs in the main entrance. When a friend is in a wheelchair, he/she has to call me on the phone (it is not even possible to access the intercom because it is at the top of the 6 mentioned steps) and, in addition, I have to go down to the garden to open the gate because there is no intercom there. What’s more, the elevator does not reach the top, thus I cannot access the roof (the upper community terrace where people can hang clothes and where the air conditioners are).’

In conclusion, in this case it is clear that accessibility was not understood as a basic priority to ensure, but was provided only as a secondary option by means of an alternative entrance with unequal features. Again, it is important to highlight the fact that this lack of equality in design is translated into hindering even more the situation of the people affected, generating longer paths for those who suffer precisely from mobility impairments. Instead of making daily activities easier for those who need it most, they are made even more difficult. Another respondent says that *‘the building code is not respected’*, but more significant is the reflection made when he/she adds that *‘the problem lies in the lack of essential accessibility teaching in schools of architecture and among professionals in architecture.’*

Living in an environment that does not meet the user’s needs can be very disappointing and generate a feeling of despair. The assumption is that living in an accessible place can improve the user’s self-esteem. So, in an attempt to measure this belief, all the respondents who stated they had moved to an accessible new place due to their disability were further evaluated with the following two questions (see next Tab.9). The statistics of the second question will be compared with those of the people who had moved to a new ‘accessible’ place but still say they are not satisfied with its accessibility:

Table B.9: Enquiries on accessible housing

| HAS IT BEEN DIFFICULT TO FIND/BUILD YOUR ACCESSIBLE HOUSING? | | | | | |
|--|---|------|---|---|---|
| Not at all.....Very much | | | | | |
| Spaniards (45/75) | 1 | 2.89 | 3 | 4 | 5 |
| Finns (14/22) | 1 | 2 | 3 | 4 | 5 |

| HAS YOUR SELF-ESTEEM IMPROVED AFTER MOVING TO AN ACCESSIBLE PLACE? | | | | | | | | |
|--|-----------------------|------------|------------------------------|------------|----------------------|------------|------------------------------|------------|
| | Spanish respondents | | | | Finnish respondents | | | |
| | NOT satisfied (10/45) | | EVERYONE who have moved (45) | | NOT satisfied (4/14) | | EVERYONE who have moved (14) | |
| | % | Real value | % | Real value | % | Real value | % | Real value |
| Yes | 60% | 6/10 | 58% | 26/45 | 75% | 3/4 | 79% | 11/14 |
| No | 10% | 1/10 | 7% | 3/45 | 25% | 1/4 | 14% | 2/14 |
| It doesn’t apply | 30% | 3/10 | 35% | 16/45 | - | - | 7% | 1/4 |

Source: Own elaboration based on PRM surveys

Again, in the previous table, for an easier reading of the results, the options with a higher score have been highlighted in bold letters and in different colours for each country. In conclusion, Finns declare that finding an accessible place to live is somehow difficult, at least more so than for Spaniards on this matter. On the other hand, as expected, users feel happier in an environment designed to meet their needs.

Furthermore, I aimed for a general understanding about the reality of accessible environments: Is it something commonly present in our surroundings? Or, on the contrary, does the general lack of accessibility reduce the social activity of PRM and, indirectly, also their self-esteem, confidence, and dignity? Firstly, the results of two basic questions concerning the easiness of moving around the city or visiting somebody else’s place will be presented (see Tab.B.10 and Tab.B.11). Following that, a similar

question will be asked but in a different format that will be more focused on learning about the perception of accessibility when travelling around, that is, out of controlled routines and familiar contexts (see Tab.B.12). Lastly, a direct interrogation on the relationship between disability and discrimination will be addressed (see Tab.B.13):

Table B.10: Enquiries on general outdoor accessibility

| HOW EASILY CAN YOU VISIT FRIENDS AND/OR FAMILY? | | | | | |
|---|--|-------------|-------------|---|---|
| | Very hard / InaccessibleVery easy / Barrier-free | | | | |
| Spaniards (75) | 1 | 2.71 | 3 | 4 | 5 |
| Finns (22) | 1 | 2 | 3.18 | 4 | 5 |

Source: Own elaboration based on PRM surveys

Surprisingly, Finns state that it is easier to visit friends and/or family than do Spaniards. It is especially surprising when taking into account the previous question ‘*Has it been difficult to find/build your accessible housing?*’, where the overall response was that Finns find it more difficult than Spaniards to find accessible housing. This incongruence could be understood by the sense of autonomy vs. dependency that each country may have. For instance, public welfare in Finland is notably higher, and many disabled people have support from an assistant. Also, it is worth paying attention to the extremely different climatic conditions that both countries have, in the sense that wintertime in Finland means lots of snow and icy surfaces, which notably hinders mobility for wheelchairs or crutches. Therefore, the need to have somebody assist the person with mobility impairment becomes more necessary, and this fact could be translated into PRM being more accustomed to getting help for doing things.

As a presumed conclusion, Finns answer that they can visit family/friends easily, even though they may need help to do so. Alternatively, Spaniards tend to answer that something is accessible only when they can actually do it by themselves, as this (out of context) comment from an angry Spanish respondent shows:

‘Please stop saying once and for all that the metro and the bus, at least in Barcelona, are adapted, because THEY ARE NOT, until a person with reduced mobility can TRAVEL ALONE, it won’t be accessible.’

Concerning the ease of moving around in the public built environment, sadly and as expected, respondents are more likely than unlikely to find themselves in an inaccessible environment:

Table B.11: Enquiries on general outdoor accessibility (bis)

| HOW OFTEN DO YOU FIND YOURSELF IN AN INACCESSIBLE PHYSICAL CONTEXT? | | | | | |
|---|--|---|-------------|---|---|
| | Rarely / NeverContinually / Always | | | | |
| Spaniards (75) | 1 | 2 | 3.19 | 4 | 5 |
| Finns (22) | 1 | 2 | 3.68 | 4 | 5 |

Source: Own elaboration based on PRM surveys

In relation to travelling and visiting new places for the first time:

Table B.12: Enquiries on travelling

| WHICH OF THE FOLLOWING SENTENCES BEST SUITS YOUR ATTITUDE TOWARDS TRAVELLING? (you can tick more than one) | | | | |
|---|-----------------------|--------------|-------------------|--------------|
| | Spaniards (75) | | Finns (22) | |
| | % | Real value | % | Real value |
| I like to travel and I do it often | 38% | 28/75 | 45% | 10/22 |
| I would like to travel more but I am afraid of the lack of accessibility | 68% | 50/75 | 68% | 15/22 |

| WHICH OF THE FOLLOWING SENTENCES BEST SUITS YOUR ATTITUDE TOWARDS TRAVELLING? (you can tick more than one) | | | | |
|---|----------------|------------|------------|------------|
| | Spaniards (75) | | Finns (22) | |
| | % | Real value | % | Real value |
| I've had bad experiences when travelling because people treated me badly | 15% | 11/75 | - | - |
| I have bad memories of travelling because I felt trapped and very dependant | 14% | 10/75 | 23% | 5/22 |
| I am too lazy to travel and I'd rather stay at home | 5% | 4/75 | 5% | 1/22 |
| I do not like travelling | 4% | 2/75 | - | - |

Source: Own elaboration based on PRM surveys

Once more, concern about the environment's lack of accessibility is present in PRM's minds, especially when travelling to some place new where barrier-free conditions are uncertain. Nevertheless, the respondents also declared they travel often, despite this concern. A further appropriate question would be to ask if travelling often means to be loyal to nice accessible destinations they already know, rather than visiting different new places. It would also be interesting to learn how the destination is chosen and how they check for accessibility. This information, although considered very interesting for tourism studies, is out of the scope of the present research.

To conclude, let's observe the level of agreement with the following statements:

Table B.13: Enquiries on disability and discrimination

| Disagree.....Agree | | | | | | |
|--|----------------|---|-------------|-------------|-------------|---|
| I have never felt discriminated against because of my disability | Spaniards (75) | 1 | 2.61 | 3 | 4 | 5 |
| | Finns (22) | 1 | 2.68 | 3 | 4 | 5 |
| I feel disabled only when I cannot access my destination because there is no accessible entrance | Spaniards (75) | 1 | 2 | 3.39 | 4 | 5 |
| | Finns (22) | 1 | 2 | 3.59 | 4 | 5 |
| I find it hard to access study and/or work opportunities because of the lack of physical accessibility | Spaniards (75) | 1 | 2.99 | 3 | 4 | 5 |
| | Finns (22) | 1 | 2 | 3.14 | 4 | 5 |
| I feel discriminated against due to certain social attitudes towards people with disabilities | Spaniards (75) | 1 | 2.59 | 3 | 4 | 5 |
| | Finns (22) | 1 | 2.68 | 3 | 4 | 5 |
| I feel discriminated against due to the built environment design | Spaniards (75) | 1 | 2 | 3.43 | 4 | 5 |
| | Finns (22) | 1 | 2 | 3.59 | 4 | 5 |
| I have a high awareness of my disability, independently of the context | Spaniards (75) | 1 | 2 | 3 | 4.04 | 5 |
| | Finns (22) | 1 | 2 | 3.91 | 4 | 5 |
| I find it hard to access study and/or work opportunities because of people's prejudices towards people with disabilities | Spaniards (75) | 1 | 2.59 | 3 | 4 | 5 |
| | Finns (22) | 1 | 2.95 | 3 | 4 | 5 |

Source: Own elaboration based on PRM surveys

The three most agreed statements have been highlighted in bold letters. For both countries, the ranking has been the same: In the first place, and with a notable difference in points, respondents affirm

that independently of the context –how accessible or inaccessible it is– they have a high awareness of their disability. Interestingly and surprisingly, though, is the third place response, in which they declare that the perception of ‘feeling disabled’ is only –or particularly, at least– produced when they cannot access their destination due to the inaccessibility of the place. Thus, the perception of being disabled is a consequence of the environment. As the reader can see, these two statements act as opposites to some extent. In an attempt to provide an understanding for this incongruence: the reason can be that disabled users are just too accustomed to finding difficulties in their interactions with their environment and, little by little, this perception of ‘not being able because of (no lift, elements too high, etc.)’, becomes merely ‘not being able’, and nothing more.

On the other hand, the second of the top three statements is the one relating to the sense of ‘discrimination’ as a consequence of improper design. Thus, the assumption that people can feel ‘discriminated by design’ –as originally maintained by the British *Disability Discrimination Act* (1995)– is corroborated by this group of respondents. The lack of equality in accessible solutions is greatly responsible for this: it is not enough to provide an alternative accessible answer to a problem if it is not equal in terms of quality, practicability and comfort, as described so well by the aforementioned respondent complaining about the ‘false accessibility’ of the building built in 2000 where he/she lives.

B.3

Conceptual summary

Following is a summary of all the diverse concepts that appeared throughout the analysis of the data obtained in the PRM surveys, with some other relevant comments included that were given by the respondents as final feedback at the end of the survey.

B.3.1 Poor implementation of accessibility standards

The poor implementation of accessibility requirements manifested itself broadly throughout the survey results analysis. This perhaps also demonstrates a conflict of interests because of claims such as ‘**public buildings, despite the fact of being ancient places, must be adapted as far as possible**’, or ‘**mandatory adaptation for all public buildings within a time limit**’, which proves the fact that there is some kind of conflict in balancing equal rights for all human beings with the laws for preserving heritage. This topic will be discussed at length in the case study IP LOCUS.

Decisions are never easy when concerning historical buildings, and this lack of determination translates into broken political promises and discontent towards the administration. One example of this was provided by a respondent from Seinäjoki, who complained about the unfulfilled promise that the movie theatre in his/her city would be adapted (already presented in the previous section). Another pertinent comment to quote is the one given by a Finnish respondent as final feedback: ‘**My cottage is actually disqualified from Porvoo. Here, if anywhere, officials and decision-makers are the biggest obstacle to a barrier-free environment and housing permits!**’

Likewise, a conflict of interests appears when dealing with accessibility vs. fire regulations or sustainability concerns. In the fire regulations scenario, this is especially evident in the case of doors in Finland, which are very heavy and/or have strong spring door closers due to the demanding regulations aimed at isolating fire. These requirements for safety in the event of fire notably hinder the opening of doors by PRM, as several respondents complained. This is the reason why many doors in Finland are equipped with an automatic opening button; but depending on electronic devices is never a full guarantee of autonomy, due to the habitual ‘out of order’ problem. On the other hand, other kinds of electronic devices are installed for sustainability purposes, such as the time-delayed lighting meant for the light to automatically turn off after a given time period. These time-delay switches are often installed in public areas, like in apartment building stairways, to ensure that the lights are not on when nobody is using the space. The problem lies in calculating the duration of this time period, since the average time programmed is often too short for PRM (as are street lights for pedestrian crossings in some cities). One respondent complained about this particular fact when explaining how often he/she ends up in complete darkness in public toilets, because the light turns off when he/she has not finished yet, and the switch is next to the door and too far from his/her sitting position on the toilet:

‘In the bathrooms, there are usually switches next to the door to turn the light on, which lasts about a minute. The ones who transfer to the toilet need more than a minute and we end up COMPLETELY IN THE DARK! The time should be reset or motion sensors installed.’

It is worth noting that, although many toilets can still be found with this specific problem, it is true that some measures have been taken, such as using motion-sensor switches instead, as the previous respondent suggested. However, these are not a full guarantee of effectiveness, especially if they are not well located; for instance, I found once myself in the situation of having to throw my shoe up in the air to turn the light back on, when even my arm waving was not enough. Of course, it was a matter of wrong location of the device installation, but what is important to understand here is that the users’ feedback is essential for evaluating the real effectiveness of designs. There are many idiotic situations like the one just mentioned, which only the final user will have the knowledge of. Somehow it is understandable that the designer does not think about such surrealistic probabilities, simply because he/she has never lived them, which leads to the next concept.

B.3.2 Co-design for a better user-oriented design

It is highly recommendable, especially when designing for people ‘with special needs’, to involve the final user in the design process, especially when aiming for good design quality.

It is notably relevant in this particular scenario because, if they are precisely labelled with the word ‘special’, it is for the reason that they are different from the ‘normal’, out of ordinary, not typical for those who are ‘non-special’; so it is conceivable that for the able-bodied these needs are somehow distant and unknown. This is why so many respondents suggested that architects should sit in a wheelchair in order to design properly, or even that the users should be the ones to design the spaces. Without aiming to take a position on these claims, what is true is that we need more feedback from the final users, because architects should not be entitled to make certain decisions on their behalf.

In short, many respondents have demanded greater interaction between designers and users, especially when talking about the design of sanitary facilities, which is often object of controversy: ‘Designers should be informed and not install grab bars or aid elements anywhere.’ In addition, let us refer again to ‘the lack of common sense’ already mentioned at the beginning of the previous analysis, with another quotation from a Spanish respondent: ‘Personally, I’ve always wondered how the hell (pardon the expression) the accessible toilet in *El Corte Inglés* (Barcelona) is used. It rather looks like a cyber torture machine...’ This complaint, with a touch of humour, evidences the essence of the accessible design fallacies: accessibility is not about placing ‘aids for the disabled’ everywhere, and they should especially not look so strange that weird stories come to one’s mind, like the torture machine evoked by this respondent, where bizarre orthopaedic devices can do who knows what.

Fortunately, it seems that co-designing processes are already happening in some places and, after seeing the results, it is expected to happen more and more. In the opinion of one Finn:

‘New public spaces have been positively surprising because of how well accessibility is now taken into account. Yet it is sometimes still forgotten that partial or full consultation with the users is needed, to choose the right solutions that are functional and suitable to the real space.’

Co-designing is not an easy process indeed, since there are as many different demands as there are different people in society. For instance, if we intend to design a table, an accessible table for wheelchair users, according to most regulations, must allow 70cm of free space underneath, which is necessary for legroom. As explained by one of the PRM survey respondents, unfortunately the majority of tables are too low, which impedes a wheelchair user from frontally approaching it due to the lack of legroom, so

he/she has no choice but to place him/herself in an oblique position. This situation can become difficult since it is not rare for a person in a wheelchair to suffer from back pain or balance problems; thus, the impossibility of properly approaching the table hinders the possibility of the user leaning on the table and obtaining the necessary support point. In other words, the people most in need of resting on the table because of having less control over their bodies are left in the most difficult position. For example, picture the challenge of having a meal without elbow support while lacking abdominal muscles, that is, no trunk balance.

What is more, having a table too low is not only annoying to a wheelchair user but to many other people as well. ‘**Is it perhaps a privilege to have a coffee and to cross legs?**’ a German speaker once asked an audience, according to a respondent. He/she finally concluded that the core of the problem lies in manufacturers fabricating tables that are too low. But on the other hand, aren’t there any other users whose requirements are different? What about children or short people needing a lower table? Or what about very tall people? Would they need a taller table? The answer is probably yes, that is why providing a variety of options instead of sticking to one single design is generally the most recommendable solution.

To sum up, co-design means to take into account the diversity of user needs by means of active participation, consultation, participative processes, etc. The aim is to fulfil the maximum requests possible coming from the greatest possible diversity of users. In other words, it is about designing for choice by means of providing a variety of options, adjustable designs, etc. so that accessibility for all is guaranteed. If so, everyone will enjoy better quality built environments because accessibility means benefits for all, as will be reasoned next.

B.3.3 Accessibility means benefits for all

Several of the experiences shared by the PRM survey respondents underscore the lack of equality in accessible solutions asserted in this PhD dissertation. Accessibility is currently conceived as an alternative solution to architectural barriers, but not as a global benefit to all. It is still not understood that barrier-free environments become easier and more comfortable for the whole population in general. This fact is especially evident in the case of an already built environment, where answers to the lack of accessibility are provided in a partial way, which generates segregated areas and thus disaggregated users.

The fact that accessibility means easier environments is a reality, just as it is a reality that people gravitate towards what is easier. It is probably for this reason that mechanical stairs are used more than regular stairs, or why lifts in public buildings can have long queues in particular situations. Indeed, a Spanish respondent suggested that ‘**the lift in a shopping centre or in a metro station should only be allowed to be used by people in wheelchairs or using strollers**’. This demand might sound a bit too radical, and probably only somebody who has experienced an endless wait to get into the lift may be able to fully comprehend. I am quite certain that he/she meant ‘*only people who need it should have preference to use the lift*’, which is not only wheelchair users, but also pushchair users, pregnant women, the elderly, somebody with crutches, luggage, health conditions, etc., especially when it concerns having preference in the waiting line. It is not out of the ordinary, indeed, to find long queues for the lift at metro stations or commercial malls. Thus two observations are worthwhile: 1) there is a tendency of people –in general, not only those with no other feasible option– to go find the lift; 2) the lift moves constantly –even if it is mainly used by those who need it– which means that there are more

users ‘with special needs’ than expected, and/or that the size and the number of necessary lifts has not been well estimated. This reinforces the argument that accessibility means easier environments that benefit everyone.

What is more, it is necessary to remark on the fact that, while this reproach was made by a Spanish respondent, no Finns complained about this matter. Thus, this could also be a cultural matter. While this conflict might be a matter of civility and proper education, it needs to be noted as well that there is a huge difference between the population density in both countries: Spain = 93 people/km² vs. Finland = 18 people/km² [World Bank: online]. This difference becomes even greater when comparing the two cities where the survey was mainly carried out: Barcelona = 15.903,5 persons/km² [IDESCAT: online] vs. Tampere = 418,31 persons/km², when considering the whole land, or 1.211 persons/km² if only estimating urban density [Wikipedia: online]. Likewise, in touristic terms, according to the World Tourism Organization’s report, Spain ranks fourth in the world’s top tourism destinations, hosting 57.7 million tourists in 2012 over the 4.2 million tourists visiting Finland in the same year [UNWTO, 2013: 6-8]. Therefore, aside from the fact that the levels of civic-mindedness could be different between Spain and Finland, it cannot be disregarded that the Spanish scenario is much more complex in terms of the number of users with different cultural understandings.

This reasoning is also useful for understanding the conflict concerning the issue of ‘toilets locked by key’ presented in the results’ analysis, which was also much discussed by the Spaniards but not the Finns. The discussion was about if accessible toilets should be only for disabled users or anybody should be entitled to use them. Those demanding an open toilet aimed to avoid the annoyance of having to go find the key, and also specified that it should be open to everyone but with priority to disabled users. The detractors argued that if the toilet is open to the general public, it is often dirtier, which is an important matter for disabled people. Again, the higher population density, together with the great number of tourists in Spain, helps to understand the reason behind this debate.

Regardless, in the opinion of an Argentinean respondent living in Spain, the awareness of disabled rights and decrease in discrimination towards PwD have improved notably in recent years, and it is only a matter of money:

‘It’s been 35 years since I’ve been using a wheelchair, and the changes have been astronomical in terms of accessibility and discrimination. Today I think that it is only limited to the economic capacity of individuals and countries. The consciousness is implemented, the laws are there and we need to implement them. For this, it is only a matter of money.’

Perhaps if implementing accessibility standards can be simplified as a matter of money, the ‘lift only for PRM’ or the ‘accessible toilet locked by key’ discussions could be simplified as a matter of time: the present society seems to be running late everywhere; we live in the immediacy of the internet era, and we expect everything at the instant of a mouse click; so people tend to choose what is faster and what means less time in the waiting line. The old cliché still stands out in many of our minds: ‘time is money’.

B.3.4 Levels of accessibility

Last but not least, what is fundamental for people with special needs is to know in detail what kind and level of accessibility is offered.

If we consider again the comment about public transportation, already previously presented in previous section B.2, where the respondent complained that only when the person can travel

autonomously can an environment be considered accessible: this reproach can be related to the present discussion, in the understanding that the core of the problem is that the information provided is not accurate enough. Obviously, it is hardly believable that the respondent meant that because the place does not ensure full accessibility without dependency, then it should not be classified at all as accessible. What he/she is demanding is to have full accessibility.

To sum up, it is equally important for good accessibility to have accessible features as it is to have information about them. To begin with, on many occasions the level of accessibility is unfortunately not satisfactory, according to many users, as the following remark describes:

‘Sometimes, the ramps for accessing the shops or other premises cause vertigo or are badly done, like in most of the buses, but they are not rectified because it is assumed that the adaptation is already done; but adapted for whom?’

Secondly, it is important to provide proper knowledge about any relevant information that is as detailed as possible for users. For instance, as already explained in depth before, if a toilet is closed by key, specific indications should be facilitated to the users a priori, in such a way that they do not need to go back to the entrance point or somewhere else to find the key.

In addition, good accessibility also highly depends on its proper maintenance and on informing adequately about any circumstantial situation, such as a lift out of order. In fact, the ‘out of order’ disappointment is quite frequent among disabled users, and for many of them if something is out of order it means that it is not accessible at all. A respondent talking about the metro explains that *‘if a lift doesn’t work in one station, it must be announced by loudspeaker’*, so that the passenger can rearrange his/her route if necessary and/or if possible. Thus, a greater amount of updated information is necessary to avoid unpleasant situations, such as arriving at your destination station and finding yourself trapped with no way out and no option for going out on the street or switching platforms to reverse the direction. In such cases, the only possibility is to get back on the train and try the next accessible station. As the reader may be anticipating, this becomes an even greater problem if the station at issue is the last accessible stop left in the transport line.

To conclude, not providing good quality accessibility and not informing about it precisely enough results in ‘false accessibility’. Let us pay attention to the following comment from one PRM survey respondent:

‘Many hotels confuse adapted with accessible, offering rooms that are not good for all disabled, so you can never trust a specification marked in their services. Sometimes, solutions that are too “contrived” are applied in buildings to make them accessible, to the point that they are too complex and usually end up being unusable (surely as a result of bad advice)’.

B.4 Raw material

Let us remember that the surveys were launched internationally from January to June 2013, thanks to the free access of the online survey software WEBROPOL. They were translated to several languages: English, Spanish, Catalan, Finnish, and Italian, but unfortunately the most significant participation came only from Spain and Finland, thus the results are concentrated in these two countries.

The English sample of the survey can be consulted in the following section B.4.1, while the full reports of the Spanish and Finnish versions will be displayed in section B.4.2. The full reports are the original ones, not modified at all; thus the respondent's remarks in the open-ended questions are either in Spanish, Catalan, Finnish, or occasionally in English, depending on the source. All the translation into English of open-ended answers can be found in the last section B.4.3.

B.4.1. Sample of the survey - English version

SURVEY FOR MOBILITY IMPAIRED USERS

Hello, my name is Marta Bordas and I am carrying out an **international research on accessibility in architectural design**, with the aim to explore how the design of our built environment can affect our perception of wellbeing and happiness.

For this reason, I would like to kindly ask you to spend a few minutes on the following questionnaire, because your feedback will be of a great value for my research. Its final aim is **to improve the design for all and to reach an inclusive architecture that provides a greater perception of a good life**.

It is important to highlight the fact that I am aware that this survey is very limited and asking specific questions only on certain issues, but not giving the whole picture of people with disabilities and accessible design. But my concern is, at this point, to evidence the problematic in the approach of accessibility codes, yet not to solve them, which would require, of course, of a more extensive research.

Therefore, the survey is organized in the following 3 sections:

A. GENERAL DATA: aimed at giving context and processing better your answers. All data is absolutely confidential.

B. REGULATIONS: aimed at learning about your opinion of accessible design in the specific study case of 'sanitary facilities for the disabled'.

C. PERCEPTION: aimed at understanding how do you experience accessibility in your daily life.

You will be asked multiple-choice questions, but you can also add remarks or suggestions, which will be very much appreciated indeed!

Thanking you in advance very much for your collaboration!!

A. GENERAL DATA**1. Country of origin:****2. Gender:**☐ M☐ F**3. Age:**☐ Under 15 years old☐ From 16 to 25☐ From 26 to 35☐ From 36 to 45☐ From 46 to 55☐ Older than 56**4. Which is your percentage of disability officially recognized? (answer between 0-100%)****5. How long have you had a mobility impairment?**☐ Since birth☐ For more than 30 years☐ For more than 15 years☐ For more than 7 years☐ For less than 7 years☐ For less than 2 years**6. Are you able to stand up and make a few steps?**☐ Yes☐ No**7. Do you have any other kind of impairment?**☐ No☐ Yes (please, specify):**8. Education:**☐ Elementary School☐ High School☐ University☐ Master / Doctorate**9. Is your profession related to design and/or architecture?**☐ No☐ Yes (please, specify):**10. Do you consider yourself an active person? Do you like to travel and/or play sports regularly?**☐ No☐ Yes (please, specify):**B. REGULATIONS:**

(aimed at learning about your opinion of accessible design in the specific study case of "sanitary facilities for the disabled")

1. Are you familiar with regulations on architectural barriers (accessibility)?

| | | | | | | |
|------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | |
| Not at all | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Very much |

2. Are you satisfied with them?

| | | | | | | |
|------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------|
| | 1 | 2 | 3 | 4 | 5 | |
| Not at all | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Very much |

3. Would you add anything to them?☐ No☐ Yes (please, specify):**4. Do you usually have problems to find an accessible sanitary facility (or one that you can use)?**

| | | | | | | |
|-------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------|
| | 1 | 2 | 3 | 4 | 5 | |
| Never | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Always |

5. Can you normally use sanitary facilities for the disabled with comfort?

Never 1 2 3 4 5 Always
☐ ☐ ☐ ☐ ☐ ☐

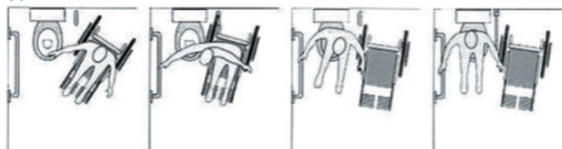
6. To satisfy your physiological needs, do you need to transfer yourself from the wheelchair to the toilet?

☐ No (please proceed to question 7)

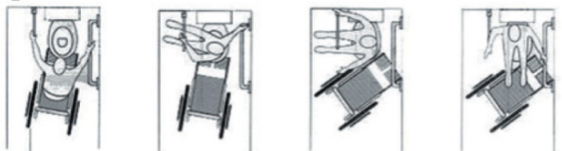
☐ Yes

6.1. Which of the given options are you able to perform? (you can tick more than one):

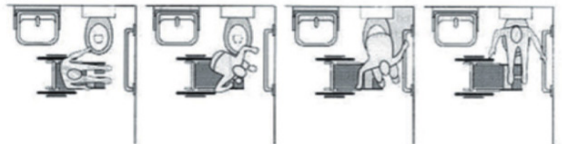
A



B



C



☐ A. Lateral transfer

☐ B. Frontal transfer

☐ C. Perpendicular transfer

☐ If other, please specify:

6.2. Which of them is easier for you? (Choose a value from 1-5: 1=easiest; 5=hardest):

| | 1 | 2 | 3 | 4 | 5 |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| A. Lateral transfer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| B. Frontal transfer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| C. Perpendicular transfer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

7. Would you like to add something about the design of accessible sanitary facilities?

☐ No

☐ Yes (please, specify):

C. PERCEPTION:

(aimed at understanding how do you experience accessibility in your daily life)

1. Are you satisfied with the accessibility of your current house?

☐ Yes

☐ No (please, specify):

2. Did you have to move to a new house, or make a big rehabilitation at your place, due to your disability?

☐ No (please proceed to question 3)

☐ Yes

2.1. Has it been difficult to find/build your accessible housing?

Not at all 1 2 3 4 5 Very much
☐ ☐ ☐ ☐ ☐

2.2. Has your self-esteem improved after moving to an accessible place?

☐ Yes

☐ No

☐ It doesn't apply

3. How easily can you visit friends and/or family?

Very hard 1 2 3 4 5 Very easy
☐ ☐ ☐ ☐ ☐

4. Which of the following sentences suits better your attitude towards travelling? (you can tick more than one)

☐ I like to travel and I do it often

☐ I would like to travel more but I am afraid of the lack of accessibility

☐ I've had bad experiences when travelling because people treated me badly

☐ I have bad memories of travelling because I felt trapped and very dependant

☐ I am lazy to travel and I rather stay at home

☐ I do not like travelling

5. How often do you find yourself in an inaccessible physical context?

| | | | | | | |
|-------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------|
| | 1 | 2 | 3 | 4 | 5 | |
| Never | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Always |

6. Value from 1 (not at all) to 5 (very much) your level of agreement with the following statements:

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| | 1 | 2 | 3 | 4 | 5 |
| I have never felt discriminated because of my disability | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I feel disabled only when I cannot access my destination because there is non accessible entrance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I find hard to access study and/or work opportunities because of the lack of physical accessibility | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I feel discriminated due to certain social attitudes towards people with disabilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I feel discriminated due to the built environment design | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I have a high awareness of my disability, independently of the context | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I find hard to access study and/or work opportunities because of people's prejudices towards people with disabilities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

Other comments or remarks:.....

THANK YOU VERY MUCH FOR
YOUR COLLABORATION!!!

B.4.2. WEBROPOL full reports

B.4.2.1. Spanish respondents

Encuesta PMR - basic %

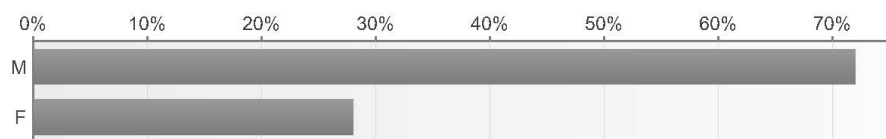
1. País de procedencia:

Number of respondents: 75

| | |
|-------------|-------------|
| - España | - españa |
| - España | - España |
| - España | - España |
| - España | - españa |
| - catalunya | - España |
| - España | - spain |
| - ESPANYA | - España |
| - España | - Argentina |
| - ESPAÑA | - España |
| - España | - España |
| - Bolivia | - españa |
| - ESPAÑA | - España |
| - ESPAÑA | - espanyola |
| - ESPAÑA | - españa |
| - España | - españa |
| - españa | - españa |
| - ESPAÑA | - catalunya |
| - ESPAÑA | - españa |
| - España | - espanya |
| - españa | - colombia |
| - España | - catalunya |
| - españa | - catalunya |
| - España | - espanya |
| - Catalunya | - espanya |
| - españa | - espanya |
| - españa | - espanya |
| - catalunya | - españa |
| - ESPAÑA | - españa |
| - ESPAÑA | - ESPAÑA |
| - españa | |
| - españa | |
| - VENEZUELA | |
| - España | |
| - ESPAÑA | |
| - España | |
| - Catalunya | |
| - España | |
| - Argentina | |
| - España | |
| - españa | |
| - Catalunya | |
| - España | |
| - españa | |
| - españa | |
| - Catalunya | |
| - España | |

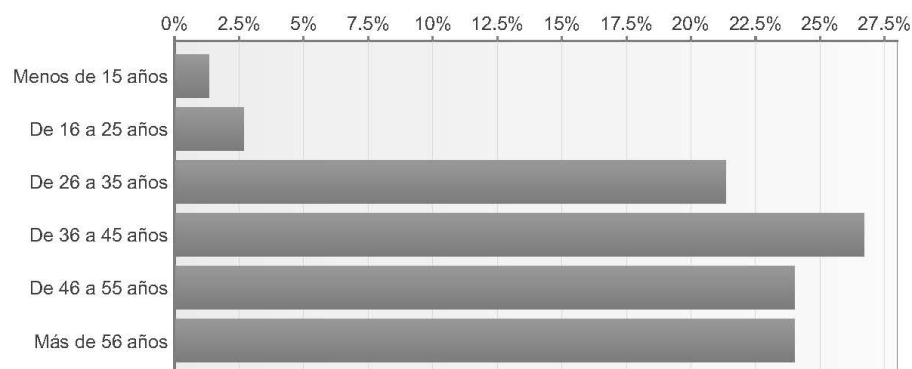
2. Sexo:

Number of respondents: 75



3. Edad:

Number of respondents: 75



4. ¿Cuál es su grado de discapacidad oficialmente reconocido?

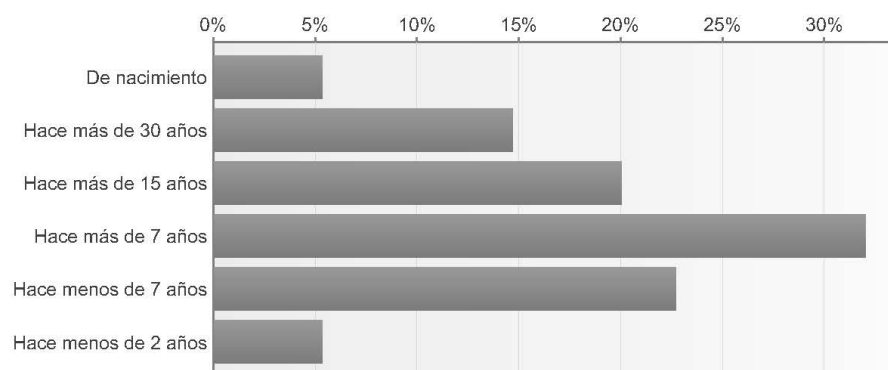
(respuesta: entre 0-100%)

Number of respondents: 73

| | | |
|--------|--------|--------|
| - 77 | - 77 | - 76 |
| - 99% | - 78 | - 80 % |
| - 81% | - 75 | - 82D |
| - 87% | - 73 | - 83 |
| - 65 | - 50% | - 81% |
| - 39% | - 68% | - 97 |
| - 90 | - 70 | - 100 |
| - 96 | - 97 | - 67% |
| - 79 | - 70% | - 72% |
| - 76% | - 82 | - 78% |
| - 98 | - 100 | - 78% |
| - 53% | - 88 | - 91% |
| - 79 | - 75 | - 78% |
| - 75 % | - 77% | - 100% |
| - 85 | - 74% | - 94% |
| - 65 | - 80% | - 92% |
| - 82% | - 82 | - 100% |
| - 66 | - 70 | - 88% |
| - 80 | - 82 | - 80% |
| - 75 | - 60 | - 95% |
| - 66 | - 100% | - 100% |
| - 80 | - 33% | - 42% |
| - 76 | - 90% | - 80% |
| - 78% | - 76 | - 88 |

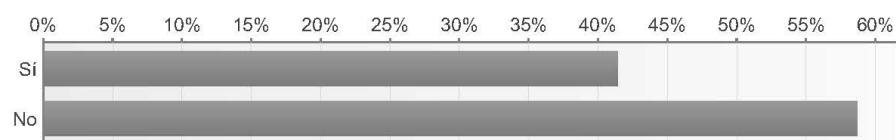
5. ¿Cuánto tiempo hace que tiene un problema de movilidad?

Number of respondents: 75



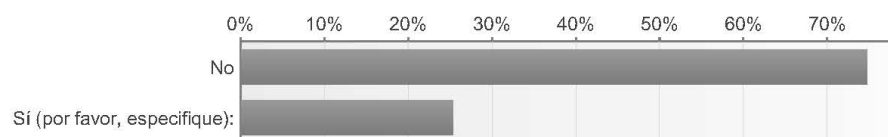
6. ¿Puede ponerse de pie de forma autónoma y dar unos pocos pasos?

Number of respondents: 75



7. ¿Tiene algún otro tipo de problema o discapacidad?

Number of respondents: 75



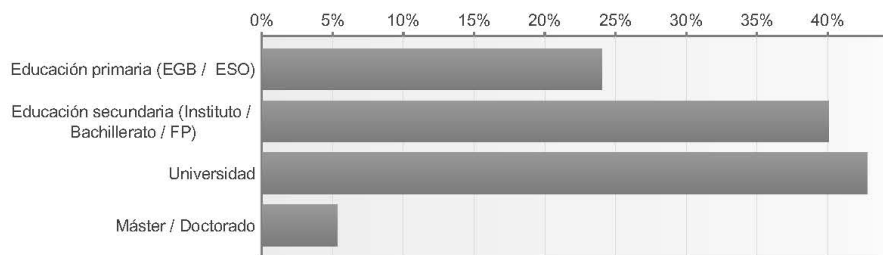
Open text answers: Sí (por favor, especifique):

- control de esfínteres
- Hidrocefalia, sordoceguera, pluridiscapacidad
- Mental
- plexo braqueal, paraplejico
- DIABETES
- Esclerosis Multiple
- TETRAPLEGIA
- MOVILIDAD
- osteoporosis
- tetraplegia
- Diabetes Mellitus
- tetraplejia

- hemiplejia derecha
- visual, sensorial, etc
- visual
- colze dret / dany cerebral
- afasia
- lenguaje
- CUADRIPLÉGICO

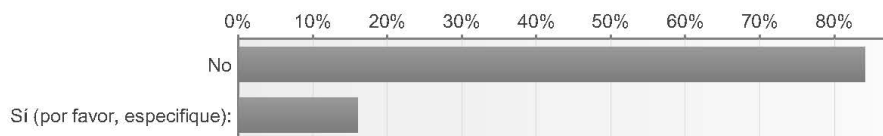
8. Educación:

Number of respondents: 75



9. ¿Su profesión está relacionada con el diseño y/o la arquitectura?

Number of respondents: 75

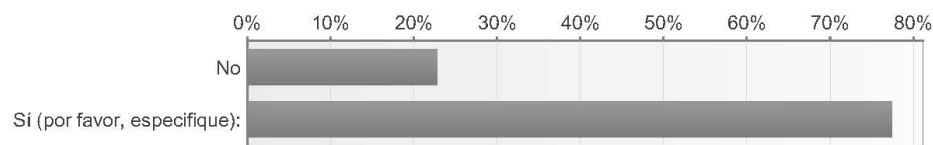


Open text answers: Sí (por favor, especifique):

- Arte
- Diseño de ayudas técnicas para la movilidad
- DISEÑO WEB
- cap d'obra
- URBANISMO
- arquitectura
- Arquitectura
- Delineante proyectista
- Fotografía, edición de video, escaneo
- Diseño gráfico+Fotografía
- Diseñador web
- PSICOLOGIA

10. ¿Se considera una persona activa? ¿Le gusta viajar y/o practicar deportes de forma regular?

Number of respondents: 75



Open text answers: Sí (por favor, especifique):

- viajar y deportes de nieve
- Viajar, correr en silla
- me gusta viajar para conocer la historia y la gente de diferentes ciudades o países, juego al tenis en silla de ruedas, practico la escalada y voy en bicicleta
- Hago natación y salgo con la bicicleta siempre que puedo.
- VIAJAR
- JUGADOR DE TENNIS
- Viajar y salir.
- viajar, caminar, ir a museos
- TENIS, NATACIÓN, HANDBIKE
- NATACION
- Yoga, handbike, gym
- Tiro al plato, caza, conducir
- handbike
- SOY ACTIVA. PRESIDENTA DE UNA ASOCIACION. Y PRACTICO DIFERENTES DEPORTES. Y ME ENCANTA VIAJAR
- VIAJAR, Y DEPORTE DE VELA
- HANDCYCLE
- Largos paseos en silla de ruedas
- Esquí, tenis, padel, handbike,
- viajar y deportes en la naturaleza
- navegar
- viajar
- NATACION BUCEO
- Natación
- viajar, nadar
- ME GUSTA EL BASKET BALL VOLLEY BALL FOOTBALL
- viajar, deporte: vela, handbike
- VIAJAR
- Viajar, moverme, no practico mucho deporte
- viajar gimnasio...
- viajar / deporte
- Natación turismo internacional
- Por mi trabajo mi vida es muy muy activa, y el viajar es una de mis preferencias en mi tiempo libre
- elite
- Viajar
- Montar a caballo
- natacion
- natación, montañismo
- Viajar (1-2 veces año)+Natación (2 días semana)
- Me gusta mucho viajar
- Natación y viajar
- no
- práctica de deporte tenis
- viajar. Abans de la lesió practicava sport (windsurf, basquet, atletisme)
- escribir, ir a comprar, la naturaleza

- viatjar i oci en general
- viatjar
- viajar, natación

1. ¿Está familiarizado/a con las normativas sobre barreras arquitectónicas (accesibilidad)?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------|------------|------------|------------|------------|----|-------|-------|---------|
| Poco | 18.67 % | 25.33 % | 30.67 % | 17.33 % | 8% | Mucho | 75 | 2.71 |

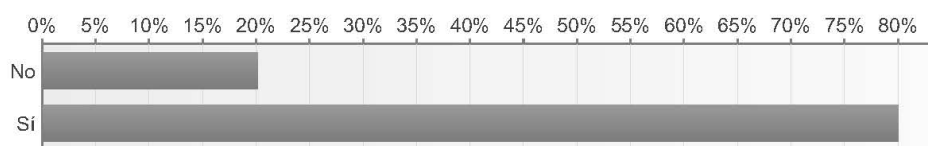
2. ¿Se siente satisfecho/a con éstas?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------|-----|------------|-----|------------|----|-------|-------|---------|
| Poco | 36% | 22.67 % | 24% | 13.33 % | 4% | Mucho | 75 | 2.27 |

3. Si estuviese en su mano, ¿añadiría algo o haría alguna modificación?

Number of respondents: 75



En caso de SI, por favor especifique:

Number of respondents: 55

- No curso EGB. Curso Educación Especial.

Ascensores, pasillos y puertas anchos dónde pasen cómodamente. al menos 2 personas (una al lado de la otra).

- A veces, las rampas de los locales son de vértigo o están mal hechas como las de la mayoría de los autobuses, pero no las modifican porque se supone que la adaptación está hecha, pero adaptado ¿para quién?
- Perseverar en adaptaciones y obligación accesibilidad obra nueva
- muchas veces el servicio está adaptado pero sucio. Sería ideal que hubiera un dispensador de desinfectante y de papel para así poder limpiar un poco el váter antes de usarlo.
- Accesibilidad en todos los transportes públicos. Al igual que está marcado el carril bici, por que no las bajadas de las aceras también esa señalización.

Y a nivel personal, que la gente se conciencie de las limitaciones de muchos de nosotros. No por lastima, eso lo último.

- MILLORARIA LES RAMPES DELS CARRERS. LES MÉS VELLES NO ACABEN LLISES, SINO QUE FAN COM UN GRAONET. AIXÓ ÉS FATAL SI VAS EN CADIRA (JO VAIG EN CADIRA ELÈCTRICA)
- Deberían ser obligatorias para todo tipo de comercios y lugares públicos, especialmente los de nueva

- creación (debería exigirse para dar la licencia municipal)
- Sacar los bordillos de los accesos a viviendas bares locales ya que esta permitido unos cm tambien sacr la normativa que solo se tiene que adaptar si tiene tantos metros cuadrados
- Haría que en primer lugar se cumpliera la normativa existente, por ejemplo acceso a bares, tiendas, restaurantes, hoteles con habitaciones adaptadas adecuadas, etc. por otra parte revisaría todo lo que son los empedrados y los vados para sillas de ruedas, así como el material que se pone en las calles porque en poco tiempo se desprende y uno se va tropezando en él. Buses sin escalones para acceder a los asientos.
- Más inspecciones en los establecimientos para asegurar que son accesibles y que hay aseos adaptados.
- OBLIGAR A LA ADAPTACIÓN DE ACERAS Y BAÑOS
- que haya alguien que vaya en silla para que sobretodo las rampas de las aceras las dejen en condiciones
- AÑADIRÍA MAS SANCIONES ANTE EL INCUMPLIMIENTO DE LA NORMATIVA VIGENTE
-

MAS ELIMINACIÓN DE BARRERAS

- Obligar a todo establecimiento publico que este adaptado para personas con movilidad reducida
- Mas baños públicos accesibles
- Que todo lo de obra nueva estuviera totalmente adaptado
- accesos a cota 0, res d'acceptar graons de màxim 12 cm., és impracticable autònomament.

aclaració a la pregunta 6:

no per orinar i si per defecar.

- TRANSPORTE PUBLICO (RENFE ESTA MUY MAL ADAPTADA)
- CALLES DE LA CIUDAD
- EL COMERCIO, SOLO PUEDO IR A COMPRAR A CENTROS COMERCIALES NUEVOS, LA MAYORIA DE COMERCIO Y RESTAURACION NO ESTA ADAPTADA O MAL ADAPTADA CON RAMPAS QUE NO SIRVEN DE NADA (YO LES LLAMO RAMPAS DE LANZAMIENTO)
- EDIFICIOS EN GENERAL LA MAYORIA DE RAMPAS NO SON PRACTICABLES
- sancionar el incumplimiento
- sobre todo, unificaría las normativas (evitaría que hubiera una para cada país, comunidad autónoma, ciudad, ...) para garantizar que, cuando se hable de que "algo es accesible", todo el mundo entienda exactamente lo mismo por ello, sin necesidad de especificar.
- TRATARIA DE DISEÑAR UN APARATO PARA PODER HACER QUE LA PERSONAS DISCAPACITADAS PUEDAN ESTAR EN PIE, TRASLADARSE ERGUIDOS SIN NECESIDAD DE SILLAS DE RUEDAS, UNA ESPECIE DE ROBOT
- Exigiría racionalización en la aplicación de las normas: escalones de acceso a edificios y, en cAmbio, rampa interior; baños "adaptados" solo porque tienen una barra en el inodoro, por ej, pero ninguna en la ducha que exige bipedestación y carece de asiento; pavimento en polideportivos altamente deslizantes, por ej alrededor de la piscina, solo porque es más resistente a lo largo del tiempo. Todo esto lo encuentro en edificios a los que se les ha reconocido oficialmente la categoría de "adaptado"
- Acceso completo para la mayor autonomia posible al baño en las playas.

Plazas suficientes de aparcamiento reservado, Control exhaustivo de la tarjetas de aparcamiento. Aplicaciones sobre gps para localización de las plazas reservadas

- Buscaría más consenso en cuanto al diseño universal, especialmente en los puntos donde chocan la accesibilidad para PMR y la accesibilidad para personas con deficiencias sensoriales.
- Principalmente haría que se cumplieran las normas, respetaran por todas las personas y revisaría todas las adaptaciones porque en la mayoría de los casos tienen algún fallo.
- establecimientos accesible
- Viví en varios países y en el mío contribuí a informar a quienes hacen las reglas alcanzando proyectos y compartiendo mis experiencias personales.
- Explicar, enseñar a los diseñadores del sector que la accesibilidad no es poner una barra en un baño, la accesibilidad es el estudio de ese espacio para que sea lo mas cómodo para la persona con movilidad reducida, transferencias etc.
- si canviaria si pudiera la forma en que esta ideado el mundo,por lo demás ,és una batalla perdida que como no dejo que me influya ,me abstengo de cualquier inconformidad,la famosa frase de AJO ...Y AGUA..... JEJEE!!
- Obligatoriedad de adaptación para todos los locales públicos en un límite de tiempo
- Me gustaría que las aceras fueran a ras del suelo para no tener que subir ese escalón que abecés es imposible, menos cuestas y mas paseos para que podemos pasear por la ciudad,

- Como uno mas, eliminaria, todas las escaleras
- Con respecto a plazas de aparcamiento. Hoteles con habitaciones y baños accesibles
 - las rampas menos empinadas
 - Todo y mi reducido conocimiento, en muchas escaleras la barandilla está solo a un lado y la rampa es demasiado empinada.
 - facilitar el acceso a la vivienda en mi caso lo tengo fatal y tengo un solo escalon de entrada de 18 centimetro de alto un una casa nueva
 - Las normativas son muy amplias, especificas y al final, sobre el papel, solo teoria y declaración de buenas intenciones, pero lo que realmente cuenta es la autentica realidad. Con esto quiero decir que una rampa es correcta si es accesible, util y cómoda para ser utilizada, si se hace una rampa excesiva, con bordillos y de mucha inclinación, NO SE PUEDE CONSIDERAR COMO ADAPTACION, sigue siendo una barrera, y segun como puede ser peor, porque donde hay una barrera ya lo ves, pero en una accesibilidad mal planteada puedes caer y es peor, son una trampa. Es preferible que se haga menos, pero correctamente y bien supervisado. Y por favor queden de decir de una vez por todas que el metro y el autobus, por lo menos en barcelona, estan adaptados, porque NO LO ESTAN, mientras que una persona con movilidad reducida pueda VIAJAR SOLA, no lo estará.
 - Mayor control de las normas vigentes.
Control periodico y arreglo si hace falta del asfalto de las aceras y las calles.
Prohibición de escaleras para acceder a los servicios en locales públicos.
 - entrada a locales del día a día mas accesibles no solo multinacionales.
 - Transporte público (Barcelona) sigue siendo en algunas zonas bastante complicado o imposible.
Numerosos hoteles confunden adaptado con accesible, ofreciendo habitaciones que no son aptas para discapacitados, por lo que no puedes nunca fiarte de las especificaciones que marcan en sus servicios.
En ocasiones se ven edificios con soluciones demasiado "rebuscadas" para convertirlos en accesibles, ofreciendo soluciones que a veces de tan complejas suelen acabar siendo inutilizables (producto seguramente de mal asesoramiento).
 - los sanitarios de los lugares públicos no siempre tienen la altura necesaria.
 - Contratar a inspectores que corroboren que la accesibilidad es correcta y se mantenga (ascensores que no funcionan!!!)
Que la ley se cumpla!!!
 - Aparcamiento en aceras, modificar la pendiente de las rampas para minusvalidos, acceso a los metros,
 - servicios adaptados unisex ya que necesito ir acompañado no dentro de los hombres o mujeres
 - que los arquitectos se sienten en una silla y así harían las obras y reformas.
 - Que aunque fueran locales antiguos les obligaran, en la medida de lo posible, al ser locales públicos estar adaptados.
 - que todos los establecimientos públicos tengan wc adaptado
 - una pujada/baixada (rampa) per accedir a botigues i pisos a més del replà
 - que sólo pudieran cojer el ascensor de metro o centros comerciales personas en silla de ruedas o cochecitos
 - Canvi a nivell de millora. Manca total d'accessibilitat
 - difícil comunicació
 - Els desnivells del carrer poden tenir una alçada màxima d'uns centímetres (segons la normativa) i considero que no hi hauria d'haver desnivells en la via pública, botigues, restaurants... Aquests desnivells impedeixen l'accés a les persones que van amb cadira de rodes
 - metro --> andana toda adaptada
ascensores --> avisar por megafonia si un ascensor no funciona en una estación
 - zonas para aparcar
más accesibilidad en el metro
 - EL 50% DE LAS AYUDAS no tendría que mezclarse con el patrimonio del solicitante, así se evitaría una progresiva reducción económica en personas con gran dependencia

4. ¿Normalmente tiene problemas para encontrar un servicio higiénico accesible (o uno que pueda utilizar)?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------------|------------|-----|-----|-----|------------|------------------------------|-------|---------|
| Raramente / nunca | 18.67 % | 12% | 28% | 28% | 13.33 % | Constantemen te / siempre | 75 | 3.05 |

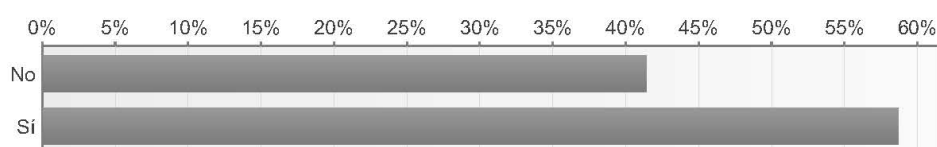
5. ¿Normalmente puede utilizar con comodidad los servicios higiénicos dedicados a las personas discapacitadas?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------------|-------|-------|-------|-----|-------|------------------------------|-------|---------|
| Raramente / nunca | 13.33 | 14.67 | 34.67 | 24% | 13.33 | Constantemen te / siempre | 75 | 3.09 |
| | % | % | % | | % | | | |

6. Para satisfacer sus necesidades fisiológicas, ¿necesita transferirse de la silla de ruedas al váter?

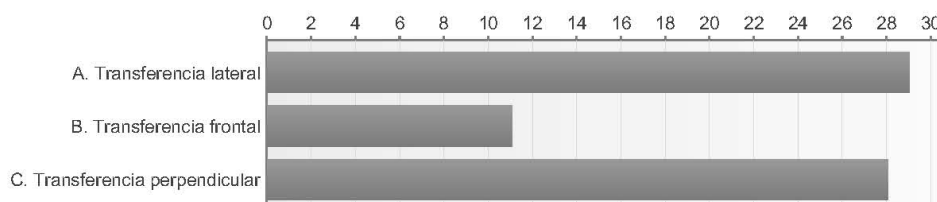
Number of respondents: 75



6.1. ¿Cuál de las siguientes opciones es capaz de realizar?

(puede escoger más de una opción)

Number of respondents: 44



En caso de OTRO, por favor especifique:

Number of respondents: 8

- me puedo levantar y realizar la transferencia con mucha más facilidad
- Siempre con ayuda auxiliar
- LAS PUEDO HACER TODAS
- camino con bastón. O sea me pongo de pie.
- No voy en silla de ruedas, llevo dos bastones ingleses con lo cual la transferencia es relativamente fácil aunque para orinar debo hacerlo sentado
- con ayuda
- Yo solo ninguna.
- con ayuda para la ropa

6.2. ¿Cuál de ellas le resulta más fácil de realizar?

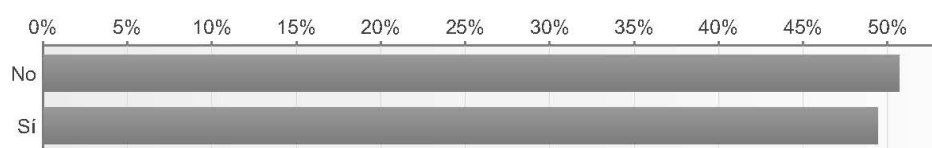
(escoja un valor de 1-5: 1=más fácil; 5=más difícil)

Number of respondents: 44

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|--------------------------------|--------|--------|--------|--------|--------|-------|---------|
| A. Transferencia lateral | 31.82% | 15.91% | 20.45% | 9.09% | 22.73% | 44 | 2.75 |
| B. Transferencia frontal | 11.36% | 9.09% | 22.73% | 13.64% | 43.18% | 44 | 3.68 |
| C. Transferencia perpendicular | 20.45% | 11.36% | 34.09% | 13.64% | 20.45% | 44 | 3.02 |
| Total | 21.21% | 12.12% | 25.76% | 12.12% | 28.79% | 132 | 3.15 |

7. ¿Le gustaría añadir algo sobre el diseño de servicios higiénicos accesibles?

Number of respondents: 75



En caso de SI, por favor especifique:

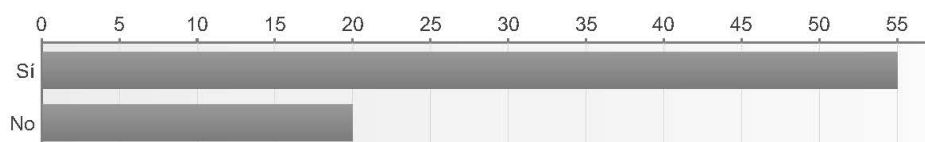
Number of respondents: 36

- Toallas desechables o servilletas absorbentes
- Yo actualmente vivo en Coma-ruga. pero he vivido toda mi vida en Barcelona y he de remarcar que muchos locales públicos e incluso alguna línea de tren han hecho mucho por la accesibilidad, ya no solo en lavabos sino también en Transporte. Aunque aun faltan.
- En Italia la normativa debe de ser más dura porque es fácil encontrar baños accesibles incluso en los lugares más teóricamente inaccesibles.
- sacar la barra del sitio donde ponemos la silla molesta mucho
- A veces las barras de apoyo no están colocadas adecuadamente.
- El dispensador de jabón, las perchas, el secador de mano o las toallas para secarse deben estar colocados más bajos.
- En la mayoría el alzador es de una pieza entera y no me es fácil a la hora de usar el papel higiénico, sería mejor un alzador con hueco lateral para meter bien la mano.
- son muy genericos y no son nada específicos para algunas personas
- EN MUCHAS OCASIONES UTILIZAN LOS ASEOS ADAPTADOS COMO ALMACEN.
- QUE LAS BARRAS TENGAN UNA DISTANCIA DEL WATER A LA PARED DONDE PODER HACER PALANCA PARA SUBIRTE LOS PANTALONES. SI ESTA MUY CERCA NO PUEDES HACER LA PALANCA.
- PONGAN COLGADORES A UNA ALTURA DE 1,50 PARA COLGAR CHAQUETA...
- FACIL ACCESO AL PAPEL HIGIENICO, Y QUE SEA FÁCIL DE SACAR.
- QUE LAS BARRAS SEAN ABATIBLES Y NO PEGADAS AL SUELO, QUE QUITAN ESPACIO PARA COLOCARTE.
- LA ALTURA DEL WATER FUERA, 60 CM (CREO), ES+UVIERA A LA ALTURA DE UNA SILLA PARA REALIZAR LAS TRANSFERENCIAS CON MAS FACILIDAD.
- UN CARTELITO EN LA PUERTA DE OCUPADO O VACIO PARA IDENTIFICAR QUE ESTA OCUPADO SIN TENER QUE CERRAR EL PESTILLO. YO NO CIERRO EL PESTILLO POR MIEDO A CAERME Y NO PODER PEDIR AYUDA.
- SISTEMA PARA PEDIR AYUDA
-
- QUE SEAN OBLIGATORIOS
- Seria ideal disponer de grua
- normalmente al ser de mayor capacidad los usan de trastero y luego es de difícil acceso
- Que muchos no son "accesibles" como hacen constar
- col.local alces al wàter, mirall a l'alçada adequada, sífò reduït o empotrat a paret

- no sabría por donde empezar: desde la higiene (normalmente muy mala), el uso de los servicios por personas que no lo necesitan, servicios normalmente cerrados con llave sin instrucciones a quien acudir para abrirlos, las barras de apoyo a un metro de distancia o puestos de tal manera que acaban siendo obsoletos, servicios completamente apartados de los demás servicios, cuando se podría unificar el uso de ciertas instalaciones con personas no discapacitadas, etc etc etc
 - DEBERIAN DE MEJORAR SOBRE TODO PARA BAÑARSE
 - Hay que estudiar qué puntos de apoyo se van a instalar. En áreas de servicio de autopistas es muy frecuente encontrarlos cerrados, por lo que tengo que volver a la entrada a solicitar la llave; en estos casos, me los encuentro utilizados como almacenes de los más variados objetos.
 - Algunas veces estan bien diseñados pero mal utilizados porque sirven de almacén donde acumulan objetos que acaban dificultando la movilidad y la llave suele tener que pedirse a muchos metros de distancia
 - Sería muy interesante introducir en España y otros países Europeos la Eurollave, una iniciativa que lleva años usándose en Alemania, Austria y Suiza para garantizar la higiene y correcto uso de los servicios higiénicos públicos (se entiende también los que estén destinados al público gral. dentro de una institución privada). Se trata de una llave que cualquier persona que acredite su discapacidad puede adquirir y con ella -una vez instaurado y extendido- puede usar cualquier servicio público sin tener que encontrárselo descuidado o pedir que se lo abran.
 - deberían diseñarlos los que los usuarios
 - Que cuando lo realicen se informen y no pongan los barrales o las ayudas en cualquier sitio.
 - Si la altura de espejo y la basura tambien tienen que ser accesibilidad porfavor que esto se diga a los estudios arquitectónicos, decoradores etc.
 - altura del vater similar a la silla de ruedas
 - que los vateres fueran mas altos
 - son demasiado altos en algunas casos
 - Que se cuiden y respeten los espacios, y que si se hacen de nuevos, se procure, en las medidas adecuadas, crear espacios comodos.
 - en lugares como gimnasios estaria mui bien algun tipo de camilla.
 - Algunos servicios dudo que puedan ser utilizados de forma segura, suelo observar anclajes débiles, falta de tornillos, etc.
- Y a modo personal, siempre me he preguntado cómo narices (perdón por la expresión) se usa el wc adaptado del El Corte Inglés (Barcelona), parece más bien una máquina de tortura cibernética...
- Que por favor las puertas se abran hacia fuera!!!!!!
 - Por ejemplo que haya colgadores para la ropa, parecen diseñados para el verano. Parece una tontería pero no lo es. Estas navidades en los aseos para minus de las areas de servicio no habia donde colgar la americana
 - Que te encuentras muchos estropeados fuera de servicio.
 - que no sean muy bajos
 - que fueran más grandes
 - que no estuvieran cerrados
 - són petites
 - a vegades només una barra
 - que no semblin un magatzem
 -
- el diseño de servicios higiénicos accesibles es mejor ponerlos integrados al resto y no segregados y bajo llave (se convierten en almacén de limpieza y se llenan de trastos) Mejor con el resto de personas para facilitar la integración en todos los ámbitos, 2º en la etiqueta debería poner preferencia a los discapacitados y así no se excluye a los que andan, estos los pueden utilizar también, pero conscientes en dejar preferencia en caso de presenciar alguien con silla o muletas

1. ¿Está satisfecho/a con el grado de accesibilidad de su vivienda actual?

Number of respondents: 75



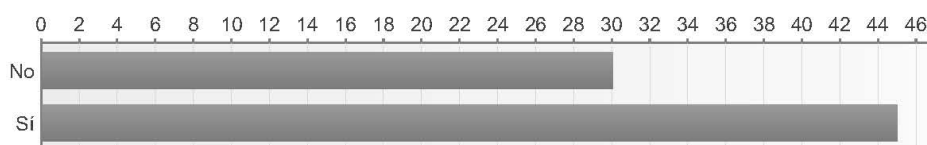
En caso de NO, por favor especifique:

Number of respondents: 21

- La ducha no es accesible, ni hay barras de movilidad por las paredes.
- En el interior de mi vivienda está todo correcto pero en el edificio la accesibilidad es relativa. Es una comunidad construida el año 2000, con lo cual cumple (o debería cumplir) con la normativa vigente en ese momento. Digamos que es accesible, pero no me parece correcto que para acceder a mi bloque tenga que entrar por el jardín comunitario porque en que la entrada principal hay 6 escalones. Cuando viene algún amigo en silla de ruedas, tiene que llamarme por el móvil (él no puede acceder tansiquiera al interfono porque está arriba de los 6 escalones) y además tengo que bajar a abrir la puerta del jardín porque allí no hay portero automático. A parte, el ascensor no llega arriba del todo, con lo cual no puedo acceder al terrado (terraza superior comunitaria donde la gente puede tender la ropa y donde están los aparatos de aire acondicionado)
- Rozo con la silla n todas partes
- pasillos estrechos,
- está clar que l'he reformada totalment.
- FALTA RAMPA ADECUADA EN LA PORTERIA, LAS PUERTAS DE CASA SON ESTRECHAS,
- SOMOS POBRES Y NO HAY COMODIDAD
- Falta accesibilidad al edificio
- Necesitaría reformas en la cocina, sobre todo.
- no vivo en un sitio adaptado...tengo resaltes,puertas estrechas,....pero me da igual ,no tengo opción!! adaptarse o morir!
- Por que vivo en un 5 piso so sin ascensor y eso limita que yo pueda salir de casa sola
- un escalon en la entrada y una rampa dentro de casa
- Sería necesario ampliar espacio del ascensor, substituir las puertas del edificio por unas más suaves y sin muelle de retorno que me impiden abrirlas desde fuera y poco más.
- Porque me la he arreglado aunque las puertas no permiten el paso de una silla de ruedas
- puertas salidas terraza balcon
- No puedo salir sin ayuda de mi cuarto y tampoco al servicio.
- ducha poco adaptada
- em costa entrar a la banyera
- Li falta adaptar coses, com els armari de la cuina. Les portes les ha d'ampliar de 70 a 90cm i posar-les correderes. Treure l'esglaó per entrar a la dutxa. La pica del lavabo l'ha de canviar perquè té un armari sota que no li permet posar les cames bé.
- no hay ascensor
- NO SE RESPETA EL CODIGO EN LA CONSTRUCCIÓN, EL PROBLEMA DERIVA DE LA AUSENCIA DE ASIGNATURA IMPRESCINDIBLE DE ACCESIBILIDAD EN LA CARRERA-FACULTADES/PROFESIONALES DE ARQUITECTURA

2. ¿Tuvo necesidad de mudarse a una nueva casa, o hacer una gran rehabilitación en la que vivía, debido a su problema de movilidad?

Number of respondents: 75



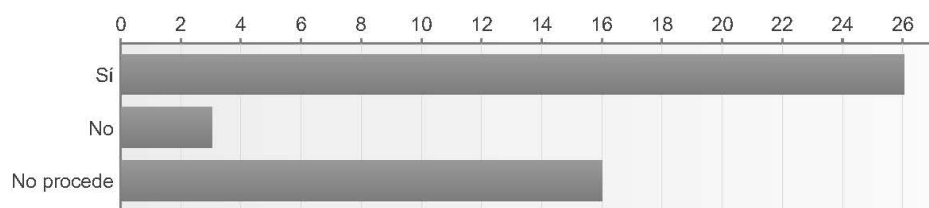
2.1. ¿Ha sido difícil encontrar/construir su vivienda accesible?

Number of respondents: 45

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------|-----|------------|------------|------------|------------|-------|-------|---------|
| Nada | 20% | 17.78 % | 31.11 % | 15.56 % | 15.56 % | Mucho | 45 | 2.89 |

2.2. ¿Su autoestima mejoró una vez se mudó a una vivienda accesible?

Number of respondents: 45



3. ¿Cómo de fácil le resulta visitar amigos y/o familia?

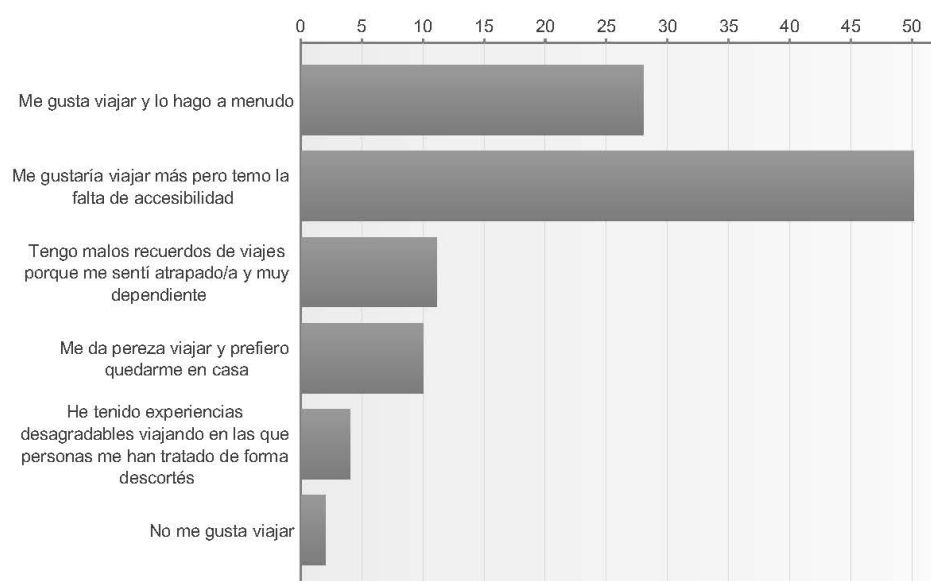
Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|---------------------------|---------|-----|---------|---------|-------|--|-------|---------|
| Muy difícil / inaccesible | 13.33 % | 28% | 38.67 % | 14.67 % | 5.33% | Muy fácil / sin barreras arquitectónicas | 75 | 2.71 |

4. ¿Cuál de las siguientes afirmaciones se aproxima más a su actitud hacia el viajar?

(puede escoger más de una opción)

Number of respondents: 75



5. ¿Se encuentra frecuentemente en entornos físicos no accesibles?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------------|-------|--------|-----|--------|-----|--------------------------|-------|---------|
| Raramente / nunca | 6.67% | 22.67% | 32% | 22.67% | 16% | Constantemente / siempre | 75 | 3.19 |

6. Valore de 1 (nada) a 5 (mucho) su grado de acuerdo con las siguientes afirmaciones:

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|--|--------|--------|--------|--------|--------|-------|---------|
| Me siento discriminado/a debido a cómo está diseñado el entorno construido | 13.33% | 10.67% | 20% | 32% | 24% | 75 | 3.43 |
| Me siento discriminado/a debido a ciertas actitudes sociales hacia las personas con discapacidad | 25.33% | 26.67% | 18.67% | 22.67% | 6.67% | 75 | 2.59 |
| Encuentro difícil acceder de forma equitativa a oportunidades de estudio y/o trabajo debido a la falta de accesibilidad física | 18.67% | 13.33% | 37.33% | 12% | 18.67% | 75 | 2.99 |
| Encuentro difícil acceder de forma equitativa a oportunidades de estudio y/o trabajo debido a los prejuicios de la gente hacia las personas con discapacidad | 24% | 21.33% | 33.33% | 14.67% | 6.67% | 75 | 2.59 |
| Tengo una gran conciencia de mi discapacidad, independientemente del contexto | 5.33% | 8% | 12% | 26.67% | 48% | 75 | 4.04 |
| Únicamente me siento discapacitado/a cuando no puedo acceder a mi destino porque no hay ninguna entrada sin barreras arquitectónicas | 9.33% | 17.33% | 20% | 32% | 21.33% | 75 | 3.39 |
| Nunca me he sentido discriminado debido a mi discapacidad | 20% | 26.67% | 32% | 14.67% | 6.67% | 75 | 2.61 |
| Total | 16.57% | 17.71% | 24.76% | 22.1% | 18.86% | 525 | 3.09 |

Otros comentarios u observaciones:

Number of respondents: 21

- Detallar que soy capaz de moverme con una muleta, pero no lo suficientemente autónomo para subir una escalera con facilidad (sin barandillas).
- Soy una persona sordociega congénita. Mi tutor ha rellenado este cuestionario por mí.
- Si tengo que viajar siempre es con mi marido ya que él se adapta a mis problemas, es imposible que pueda hacer muchas excursiones porque no se contempla ningún tipo de discapacidad. Donde más discapacitada me encuentro es en la calle ya que me encuentro muchos problemas para caminar y entrar a sitios donde hay escaleras interminables. Soy consciente de que elijo sitios adaptados y ya no me permito pensar en ir a los no adaptados.
Tengo la suerte de tener una casa adaptada, la hicimos para mi hijo que es tetrapléjico y ahora me facilita la vida a mí. También uso un scooter para moverme por la calle pero siempre me encuentro con barreras y por eso siempre voy a los mismos sitios y compro mucho por internet.
- haber si por fin alguien puede conseguir una vida mas accesible para la gente con discapacidad. buena suerte estamos contigo arriba marta.
- Hace 35 años que utilizo una silla de ruedas y los cambios fueron astronómicos en cuanto a la accesibilidad y la discriminación. Hoy creo que sólo esta limitada a la capacidad económica de los individuos y de los países. La conciencia está implantada, las leyes están hay que ponerlas en marcha y para eso solo falta dinero.
- Cualquier duda que pueda ser útil al respecto porfavor no dudes en ponerte en contacto conmigo , el tema del

diseño de la accesibilidad es una tema que cada día me atrae mas y mas.

Te dejo mi correo.

i.otazua@mac.com

Iñaki

- los que vivimos en el monte y nos dedicamos a ello ,no tenemos más opción que sentirnos impotentes ante la naturaleza ,a diario ,a la naturaleza no se la puede adaptar ,asi que ,a sufrir con todo lo que venga ,pq hemos venido a sufrir.

un abrazo!!

- Dejo mi contacto por si necesita alguna aclaración: agus-prats@hotmail.com
y gracias a ti por interesarte en mejorar las cosas.

salut!

- En los baños, generalmente hay botones, al lado de la puerta, para encender la luz la cual dura aproximadamente un minuto. Los que hacemos transferencias al bater, tardamos mas de un minuto y nos quedamos COMPLETAMENTE A OSCURAS!!! Se debería reprogramar el tiempo o colocar sensores de movimiento.

Saludos

Esteban

- Esta mas coscienzada y me trata y recivo mas ayuda de la gente joven.
- Personalment no crec que sigui un bon exemple, ja que considero la "invalidesa" aquesta com una trava al desenvolupament personal, un cop del dur m'he de recuperar i un cop fet, oblidar-me'n
- soy una persona con capacidad de subir escaleras
- hemiplejia
- tetraplegia
- hemiplejia
- hemiplejia
- tetraplegia
- hemiplejia
- hemiplejia
- tot l'apartat C no estava respost.

L'he contestat tot en neutre (valor 3 o totes les opcions clicades) per tal no no desequilibrar els resultats i si poder valorar els dos primers apartats ben contestats

- Incongruencia en llegar a cumplir el código accesibilidad, este dicta que las mesas deben estar mejor con una altura 70-90 cm encima de las rodillas, el 95% No lo cumplen, incluso en espacios públicos como bibliotecas, bares, restaurantes, etc., pero el problema esta en quien fabrica las mesas tan bajas, como decía un conferenciante alemán será a caso un privilegio tomar un café y cruzar piernas? No se puede pq son muy bajas, para los q vamos en silla es por necesidad nos fastidia en muchos contextos que las mesas sean tan bajas. Espero haber colaborado, para +? dejo mi telf. 932664626

B.4.2.2. Finnish respondents

Kysely LK - basic %

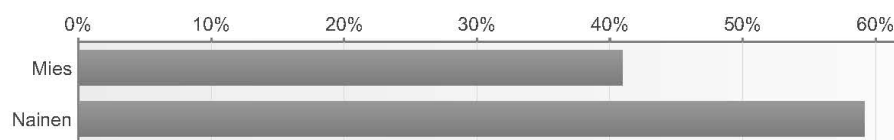
1. Tämän hetkinen kotimaa:

Number of respondents: 22

| | |
|---------|---------|
| - Suomi | - suomi |
| - Suomi | - Suomi |
| - Suomi | - Suomi |
| - Suomi | - Suomi |
| - SUOMI | - Suomi |
| - suomi | - Suomi |
| - Suomi | - suomi |
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| - Suomi | - suomi |
| - Suomi | - Suomi |

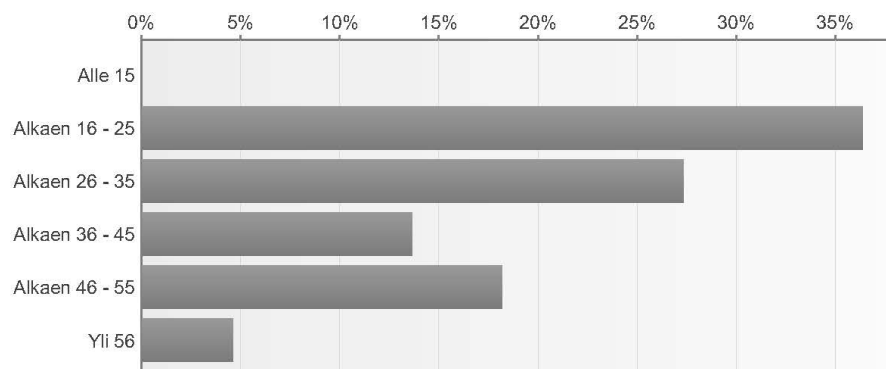
2. Sukupuoli:

Number of respondents: 22



3. Ikä:

Number of respondents: 22



4. Mikä on lääkärin luokittelema invaliditeettiprosenttinen, mikäli tiedätte sen?

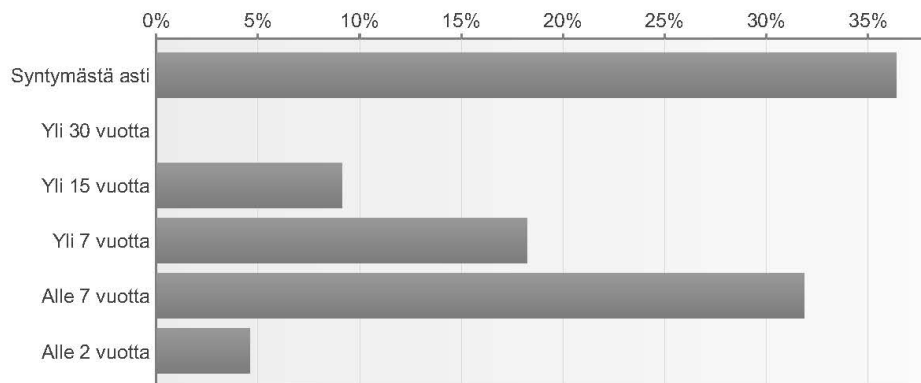
(0-100% vaste)

Number of respondents: 14

| | |
|------------|--------|
| - 100 | - 90 % |
| - en tiedä | - 80% |
| - 100 | - - |
| - 95 | - 100 |
| - 100% | - 90 |
| - 100 | - 30 |
| - 100 | - 100% |

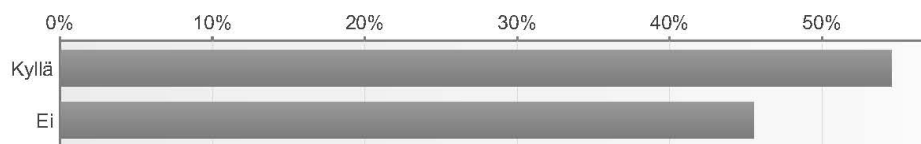
5. Kuinka kauan teillä on ollut liikuntarajoite?

Number of respondents: 22



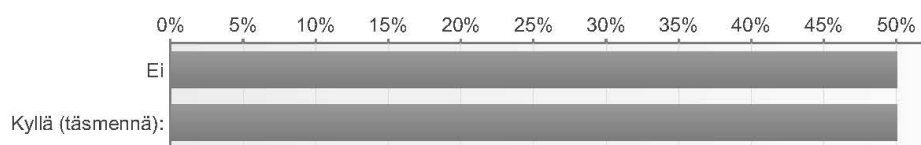
6. Pystyttekö nousemaan seisomaan ja ottamaan muutaman askeleen?

Number of respondents: 22



7. Onko teillä muuta vammaa tai rajoitetta?

Number of respondents: 22

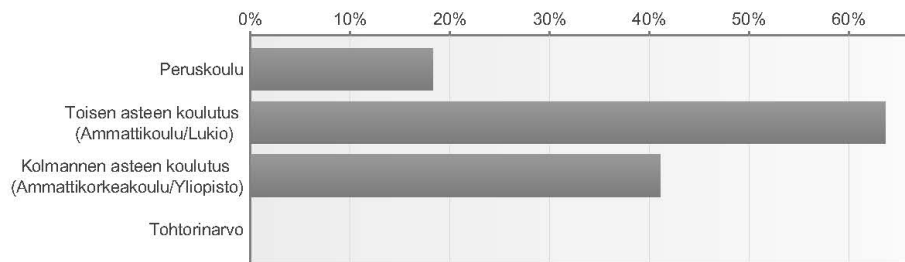


Open text answers: Kyllä (täsmennä):

- TETRAPLEGIA, ETENEVÄ
- Lievä aivovamma
- CP-vamma Spastinen diplegia
- pyörätuolin koko aikainen käyttäjä
- minussa ihan kaikkien vaikuttavan sidekudosoireyhtymän lisäksi allerginen astma/hajusteyliherkkyys
- Vasemmassa kädessä voima vielä heikentynyt
- only my right hand is working part ways (the other one isn't moving at all)
- right hand is paralysed
- impairment to walk long distances, and walking on the stairs
- shoulders are broken

8. Koulutus:

Number of respondents: 22



9. Liittykö ammattinne suunnitteluun ja/ tai arkkitehtuuriin?

Number of respondents: 22



Open text answers: Kyllä (täsmennä):

- Sähköjärjestelmien suunnittelu ja koneautomaatio
- Information and Communications Technology or (ICT)/ automatization

10. Pidätkö itseänne aktiivisena henkilönä? Matkustelletteko ja / tai harrastatteko säännöllistä liikuntaa?

Number of respondents: 22



Open text answers: Kyllä (täsmennä):

- Säännöllistä ulko- ja kotimaanmatkailua, kuntosali n. kerran viikossa.
- Harrastan pyörätuolitanssia ja matkustan usein junalla
- Harrastan pyörätuolitanssia, jonka tiimoilta olen käynyt myös ulkomailla. Olen käynyt myös risteilyllä. Junalla tulee matkustettua suhteellisen usein.
- TANSSIN, MATKUSTELLEN (RAJOITETUSTI/ESTEELLISYYS!), ÖLJYVÄRIMAALAUUS, MUTTA ESTEISYYS ESTÄÄ KURSSEILLA KÄYMISEN
- Opiskelen yliopistossa, harrastan pyörätuolitanssia, purjehdusta, lenkkeilyä, kuntosalia.
- Pyörätuolitanssi kerran viikossa, keikoilla käynti yms.
- Käyn aktiivisesti kuntosalilla. Ja matkailen kotimaassa lähinnä kesäisin autolla.
- Harrastan pyörätuolitanssia 2 kertaa viikossa ja käyn fysioterapiaa
- päivittäistä ulkoilua erilaisissa paikoissa

- Liikun kun innostun
- Matkustelen ulkomailla ja olen siellä aktiivinen mutta Suomessa en ole kovinkaan aktiivinen
- Liikun päivittäin kuten ns. normaalit ihmisetkin. Työtä ja vapaa-ajan harrastuksia yms.
- cycling with hardcycly, hunting dogs, travelling in Finland, fixing the house
- I go out often, for example in restaurants to eat
- I move as much as I can. I do rehabilitation regularly, 1 time/day at home
- I try to exercise everyday

1. Oletteko perehtynyt julkisten rakennusten arkkitehtuuriin asetuksiin esteettömyydestä?

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------|------------|------------|------------|-------|-------|------------------------|-------|---------|
| En lainkaan | 27.27 % | 31.82 % | 31.82 % | 4.55% | 4.55% | Erittäin perehtynyt | 22 | 2.27 |

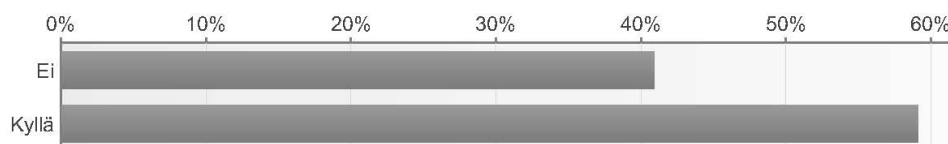
2. Oletteko tyytyväinen niihin?

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------|-------|------------|------------|-------|----|-------------------------|-------|---------|
| En lainkaan | 4.55% | 40.91 % | 45.45 % | 9.09% | 0% | Erittäin tyytyväinen | 22 | 2.59 |

3. Haluatteko lisätä niihin jotain?

Number of respondents: 22



Jos KYLLÄ, täsmennä:

Number of respondents: 11

- Hissit vanhoihin rakennuksiin.
- En osaa sanoa, kun en ole perehtynyt niihin niin tarkasti, mutta vaikuttaa siltä, että tulos olisi toimiva, jos asetuksia noudatettaisiin oikeasti kunnolla.
- ESTEETÖN RAKENTAMINEN OLISI KAIKILLE EDUKSI!
- Esteettömiä sisäänkäyntejä enemmän. Ramppien kaltevuudet pienemmäksi ym..
- Asetuksia tulisi noudattaa ja niiden rikkominen pitäisi olla rangaistavaa
- Julkisten tilojen tilat tulee olla esteettömiä. Kaupungissani seinäjoella ei ole mahdollisuutta käydä elokuva teatterissa kierreportaiden takia. Asialle on luvattu tehdä muutosta, mutta jäänyt vain puheen tasolle.
- En ole tarpeeksi perehtynyt osatakseni tehdä ehdotuksia. Käytännökokemuksiin pohjautuen oletan, että asetukset ovat riittävät, mutta toteutuksessa on epäkäytännöllisyyttä ja puutteita.
- ramps are too steep

handles should be bigger, sometimes it is hard to grab them

- I do not know what to say, I do not know about this
- I do not know them
- toilets for disabled

4. Onko teillä kodin ulkopuolella usein ongelmia löytää esteetön wc (tai wc, jota voitte käyttää)?

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|----------------------|------------|------------|------------|------------|-------|----------------------|-------|---------|
| Harvoin / Ei koskaan | 13.64 % | 13.64 % | 36.36 % | 31.82 % | 4.55% | Jatkuvasti / Aina | 22 | 3 |

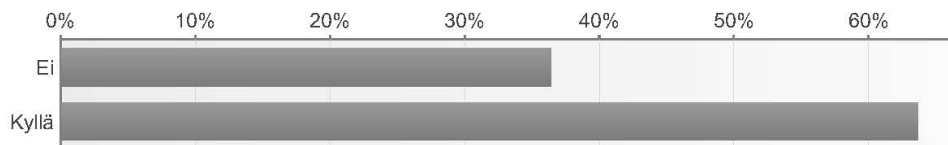
5. Jos olette esteettömässä wc: ssä, onko se yleensä suunniteltu helppokäyttöiseksi?

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|----------------------|-------|------------|------------|------------|-------|----------------------|-------|---------|
| Harvoin / Ei koskaan | 9.09% | 31.82 % | 36.36 % | 18.18 % | 4.55% | Jatkuvasti / Aina | 22 | 2.77 |

6. Tarvitseeko teidän siirtyä pyörätuolista wc-pöntölle?

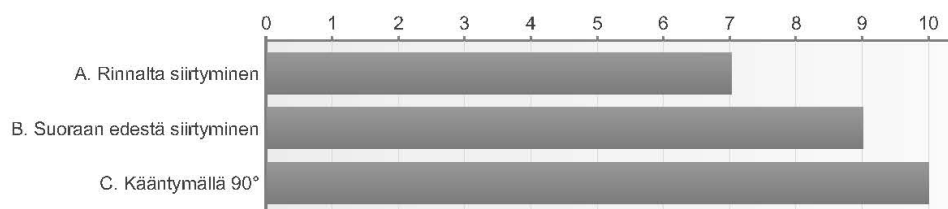
Number of respondents: 22



6.1. Millä seuraavilla tavoilla pystytte siirtymään itsenäisesti?

(voitte valita useamman vaihtoehdon)

Number of respondents: 14



Jos MUUT, täsmennä:

Number of respondents: 3

- Usein miten nousen jalkojen kautta, sillä pystyn kävelemään jonkin verran, mutta tasapaino on huono. Joskus käytän myös rollaattoria. Jos en käytä apuvälinettä wc:ssä tarvitsen jotain, josta ottaa tukea, kuten kahva. Joten en ollut ihan varma miten vastaisin....
- Avustajan kanssa kääntymällä 90 astetta
- Paremmassa kunnossa ollessani voin ottaa muutaman askeleen siirryessäni jolloin siirtyminen on vaivattominta

6.2. Mikä siirtymätapa on teille helpoin?

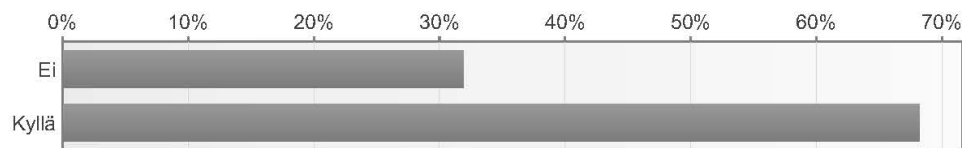
(Arvioi 1-5: 1 = helpoin, 5 = vaikein):

Number of respondents: 14

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|-------------------------------|--------|--------|--------|--------|--------|-------|---------|
| A. Rinnalta siirtyminen | 7.14% | 21.43% | 28.57% | 14.29% | 28.57% | 14 | 3.36 |
| B. Suoraan edestä siirtyminen | 42.86% | 0% | 35.71% | 7.14% | 14.29% | 14 | 2.5 |
| C. Kääntymällä 90° | 50% | 7.14% | 14.29% | 14.29% | 14.29% | 14 | 2.36 |
| Total | 33.33% | 9.52% | 26.19% | 11.9% | 19.05% | 42 | 2.74 |

7. Haluaisitteko lisätä jotain esteettömiin wc-tiloihin?

Number of respondents: 22



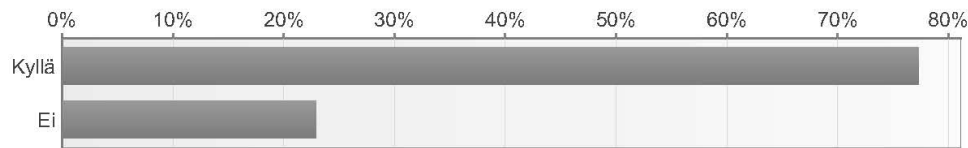
Jos KYLLÄ, täsmennä:

Number of respondents: 15

- Automaattikuivaajat alemmas, niin, että niihin voisi joskus ihan yltääkin. :)
- Pitäisi miettiä myös ovia ja kynnyksiä, eikä vain wc-tiloja.
- Voisi katsoa tarkemmin, että käsipaperit/pyyheet ym. ovat oikealla korkeudella ja että wc-paperit olisivat lähempänä wc pönttöä, ettei tarvitsisi kurotella, sillä joillekin se on mahdotonta. Myös saippuan voisi joissain tapauksissa laittaa helpommin saataville.
- WC-RULLAT KÄDEN ULOTTUVILLE! PYYHKEET TAI KUIVATUS ALEMMAKSI! KUNNOLLISET TUKIKAITEET (ON NIITÄKIN, JOTKA PETTÄVÄT ALTA TAI MUUTEN HUONOKUNTOISET)! KAIKKI YLIMÄÄRÄINEN ROJU POIS INVA-WC:ISTA! WC-RENKAAN PUHDISTUSAINE SAATAVILLA!
- Bide-suihkun kahvan tulisi ylettää wc-pöntölle letkun kiristymättä, sille pitäisi olla teline käden ulottuvilla pöntöllä istuttaessa ja se pitäisi myös saada päälle ja pois nousematta pöntöltä. WC-peilit tulisi sijoittaa siten, että niistä näkee itsensä myös istumakorkeudelta. Tämä kyllä pätee niin saippua- kuin käsipaperitelineisiin ja vaatekoukkuihinkin, jotka pääosin asennetaan seisomakorkeudelle.
- Enemmän tilaa ja järkevämpi asioiden sijoittelu
- Wc paperit ja käsipaperit tulisi sijoittaa, siten, että niitä voi käyttää helposti paikaltaan ja niihin yltää helposti
- Tsemppiä opariin
- Usein tilaa ja "vetokaiteet" oveen. Lisäksi seinäkoukkuja, ja myös käsidesiä koska esteettömissä vessoissa käy hyvin monenlaisia ihmisiä (monet pystyvät toimimaan todella rajoitetusti) joten kaikkien jäljiltä wc-istuin ei ole kovin siistissä kunnossa.
- Ovipumpulliset (tms.?) ovet ovat välillä turhan painavia avata eli invavessojen oviin ei mielestäni sellaisia kannata asentaa, onneksi se ei ole kovin yleistä.
- toilet height is too low
- toilet paper sometimes is hard to get
- toilet paper is often too far away
- automatic tap water
- I don't know
- handles
- Thinking of female customers: In many inva toilets bidet are just next to washbasin and often too far to WC

1. Oletteko tyytyväinen liikkumismahdollisuuksiinne kodissanne?

Number of respondents: 22



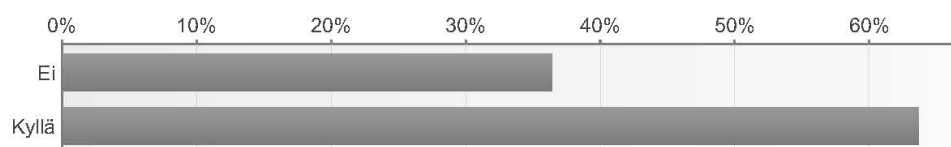
Jos Ei, täsmennä:

Number of respondents: 5

- Keittiö ei ole minulle sopiva. Tarvitsisin pyörätuolia keittiössä, sillä huonon tasapainon vuoksi en voi toimia seisten turvallisesti, mutta en voi käyttää tuolia, koska keittiössä keittokaapit/tasot eivät ole matalalla eikä sitä muutenkaan ole suunniteltu istuvan käyttöön. Asun vielä lapsuudenkodissani, mutta omaan asuntooni aion hankkia toimivan keittiön.
- EN PÄÄSE ITSENÄISESTI ULOS PYÖRÄTUOLILLANI (LIIAN JYRKÄ LUISKA ITSESTÄÄN AUKEAVIEN OVIEN ULKOPUOLELLA JA TOINEN ULKO-OVI EI AUKEA ITSESTÄÄN, JOSTA PUOLESTAAN OLISI MAHDOLLISTA MUUTEN PÄÄSTÄ PT:LLA ULOS ILMAN APUJA)
- Esteettömyyttä ja helppoa liikkumista oltaisiin voitu miettiä vähän paremmin joudun jonkin verran konttaamaan sisätiloissa mennessäni esimerkiksi suihkuun
- Pari kynnystä täytyisi poistaa ja ulko-ovella oleva pyörätuoliramppi on liian jyrkkä. Myös tukikahvoja tarvitsisin lisää.
- smaller apartment

2. Onko teille tehty huomattavia kodin muutostöitä tai oletteko joutunut muuttamaan uuteen asuntoon vammautumisenne vuoksi?

Number of respondents: 22



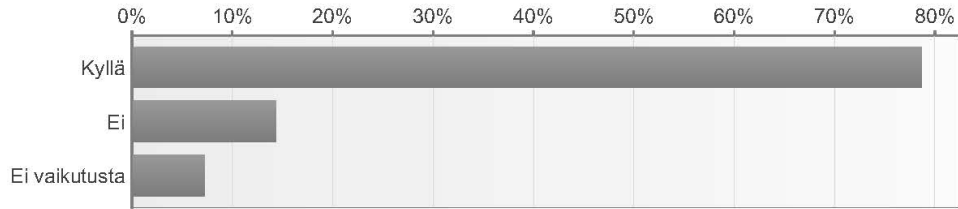
2.1. Oliko vaikeaa löytää / rakentaa esteetön asunto?

Number of respondents: 14

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|-------------|------------|------------|------------|------------|-------|---------------------|-------|---------|
| Ei lainkaan | 14.29 % | 21.43 % | 21.43 % | 35.71 % | 7.14% | Erittäin vaikeaa | 14 | 3 |

2.2. Onko itsetuntonne kohentunut muutettuanne uuteen paikkaan tai kodinmuutostöiden valmistuttua?

Number of respondents: 14



3. Kuinka helposti voitte vierailla ystäväienne ja / tai perheenne luona?

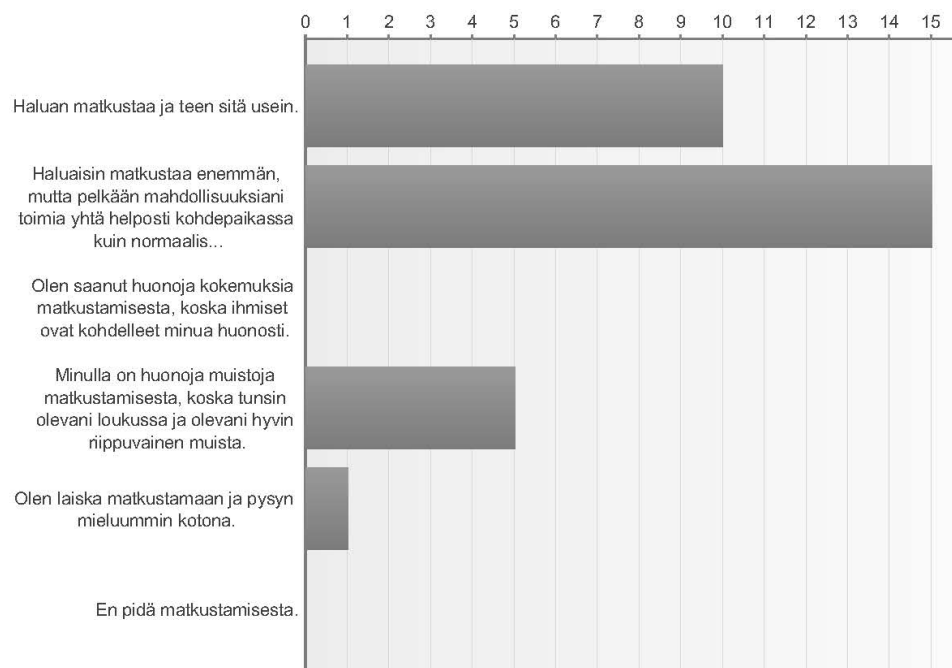
Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------------------------------------|-------|-------|---------|---------|-------|-------------------------------|-------|---------|
| Hyvin vaikeaa / saavuttamattomissa | 9.09% | 9.09% | 45.45 % | 27.27 % | 9.09% | Erittäin helppoa / ei esteitä | 22 | 3.18 |

4. Mitkä seuraavista lauseista sopii parhaiten asenteenne matkustamisesta?

(voitte valita useamman vaihtoehdon)

Number of respondents: 22



5. Kuinka usein joudutte paikkaan, jossa fyysinen ympäristö estää teidän liikkumisenne tavanomaisella tavalla?

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|----------------------|----|-------|------------|------------|------------|----------------------|-------|---------|
| Harvoin / Ei koskaan | 0% | 4.55% | 40.91 % | 36.36 % | 18.18 % | Jatkuvasti / aina | 22 | 3.68 |

6. Arvostele 1 (ei yhtään) ja 5 (erittäin paljon) seuraavien väittämien paikkansapitävyyden kohdallanne:

Number of respondents: 22

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|---|--------|--------|--------|--------|--------|-------|---------|
| Koen syrjintää, sillä rakennusten suunnittelussa ei ole otettu huomioon esteettömyyttä | 0% | 9.09% | 36.36% | 40.91% | 13.64% | 22 | 3.59 |
| Koen syrjintää, sillä ihmisillä on usein sosiaalisia asenteita liikuntarajoitteisia kohtaan | 18.18% | 22.73% | 36.36% | 18.18% | 4.55% | 22 | 2.68 |
| Minun on vaikeaa päästä opiskelemaan ja/tai saada työpaikkaan liikuntarajoitteeni vuoksi, koska rakennuksissa ei ole otettu huomioon esteettömyyttä | 22.73% | 13.64% | 13.64% | 27.27% | 22.73% | 22 | 3.14 |
| Minun on vaikea saada opiskelu- ja/tai työpaikkaa ihmisten ennakkoluulojen vuoksi, joita heillä on liikuntarajoitteisia kohtaan | 22.73% | 4.55% | 40.91% | 18.18% | 13.64% | 22 | 2.95 |
| Minulla on korkea tietoisuus omasta vammaisuudestani | 0% | 0% | 45.45% | 18.18% | 36.36% | 22 | 3.91 |
| Koen olevani vammainen vain, kun en pääse liikkumaan ympäristössä | 4.55% | 18.18% | 13.64% | 40.91% | 22.73% | 22 | 3.59 |
| En ole koskaan tuntenut itseäni syrjityksi vammaisuuteni vuoksi | 13.64% | 31.82% | 18.18% | 27.27% | 9.09% | 22 | 2.86 |
| Total | 11.69% | 14.29% | 29.22% | 27.27% | 17.53% | 154 | 3.25 |

Jos haluat lisätä muita kommentteja tai jättää viestiä, ole hyvä!

Number of respondents: 9

- Opiskelupaikan saantiin vammaisuus ei ole vaikuttanut. Työmarkkinoilta ei ole vielä kokemusta, mutta pelkään, että työnantajien ennakkoluulot liikuntarajoitteisuutta kohtaan vaikeuttavat työnsaantiani tulevaisuudessa. En aio kuitenkaan luovuttaa.
- ASUINPAIKKANI ON TODELLA ESTEELLINEN PORVOO. TÄÄLLÄ, JOS MISSÄ VIRKAMIEHET JA PÄÄTTÄJÄT OVAT SUURIN ESTE ESTEETTÖMÄN YMPÄRISTÖN JA ASUMISEN MAHDOLLISTAMISEEN!
- onnea valitsemallanne tiellä.
- Kysymyksiin työtä tai opiskelua koskien oli vaikea vastata, kun ne eivät kosketa minua tällä hetkellä kun olen eläkkeellä.
- On ollut uusissa julkisissa tiloissa positiivinen yllätys kuinka hyvin esteettömyys on (yritetty ottaa/) otettu nykyään huomioon. Tilojen suunnittelussa tuntuu välillä silti unohtuneen osittain tai kokonaan oikeiden käyttäjien kuuleminen ratkaisujen suunnittelussa oikeasti käytännöllisiksi ja tilaan sopiviksi.
- incapacidad laboral (?)
- very hard to travel
- ja no puc treballar
- ja no soc una persona activa
- My new ramp is too steep, not good. Old one was so much better (review! in Finnish version the sentence is much longer!)

B.4.3. Detail and classification of the open-ended questions

Relevant information has been obtained in the open-ended questions, where the respondents had the opportunity to express their specific concerns and particular observations regarding each issue under discussion rather than merely agreeing or disagreeing on a certain question. Since the original language of the participants was mainly Spanish, Catalan and Finnish, all these valuable remarks from the open-ended questions have been translated into English and are included next.

It must be noted that the translations on some occasions are not literal, in order to ensure their comprehension by everyone and due to the habitual slang used by disabled groups, or perhaps for some other missing context that has been taken for granted. As Finnish is not my mother tongue, I am especially grateful to Maria Kuusisto (her current married name is Maria Rantala) for her collaboration on the Finnish translation. She is a physiotherapist in the rehabilitation centre where the majority of the Finnish surveys were carried out.

All the comments from each open-ended question have been analysed and processed in search of similarities, such that they have been organised into several categories when pertinent. In addition, some of the remarks given by the respondents were quite complete and regarded different issues. Thus, in such cases they have been divided according to the different concepts classified.

A total of 4 open-ended questions have been analysed, regarding:

- **Regulations – General:** answering question B3. *Would you add anything to accessibility regulations?*
- **Regulations – Toilets:** answering question B7. *Would you add anything to accessible sanitary facilities design?*
- **Perception:** answering question C1. *Are you satisfied with the accessibility of your current home?*
- **Last comments:** free space left for the respondents to add any other comments or remarks.

The full description of each of the 4 open-ended questions is included next, both in its original language and English translation. For an easier reading, the comments that have been used during the elaboration of the surveys analysis and the conceptual summary are highlighted in bold letters:

B.4.3.1. Regulations – General:

Table B.14: Classification of answers regarding “*Would you add anything to accessibility regulations?*”

| “WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?” | |
|--|---|
| 1) | On general implementation |
| 1a) | On the mandatory nature of regulations, its control and punishment |
| 1 | The regulations must be observed and their violation should be punished <i>Asetuksia tulisi noudattaa ja niiden rikkominen pitäisi olla rangaistavaa</i> |
| 2 | I would add more sanctions for non-compliance with current regulation <i>Añadiría más sanciones ante el incumplimiento de la normativa vigente</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|---|
| 1) | On general implementation |
| 1a) | On the mandatory nature of regulations, its control and punishment |
| 3 | Hiring inspectors to certify that accessibility is correct and remains (elevators work!) That the law is fulfilled! <i>Contratar a inspectores que corroboren que la accesibilidad es correcta y se mantenga (ascensores que no funcionan!!!) Que la ley se cumpla!!!</i> |
| 4 | Penalize the breach <i>Sancionar el incumplimiento</i> |
| 5 | Greater control of existing regulations. <i>Mayor control de las normas vigentes.</i> |
| 6 | More inspections of establishments to ensure they are accessible and there are accessible toilets. <i>Más inspecciones en los establecimientos para asegurar que son accesibles y que hay aseos adaptados.</i> |
| 1b) | On the generally and customarily poor implementation |
| 1 | I do not know, since I'm not too closely familiar with them, but it seems that the result would be functional if the design really complies with the regulations correctly <i>En osaa sanoa, kun en ole perehtynyt niihin niin tarkasti, mutta vaikuttaa siltä, että tulos olisi toimiva, jos asetuksia noudatettaisiin oikeasti kunnolla</i> |
| 2 | I am not sufficiently familiar with the regulations to make suggestions. I assume that the settings are sufficient but, based on my practical experience, the implementation is weak and lacking common sense <i>En ole tarpeeksi perehtynyt osatakseni tehdä ehdotuksia. Käytännökokemuksiin pohjautuen oletan, että asetukset ovat riittävät, mutta toteutuksessa on epäkäytännöllisyyttä ja puutteita</i> |
| 3 | I would mainly comply with the rules, respect all people and have all adaptations revised, because in most cases there are errors <i>Principalmente haría que se cumplieran las normas, respetaran por todas las personas y revisaría todas las adaptaciones porque en la mayoría de los casos tienen algún fallo</i> |
| 4 | More removal of architectural barriers <i>Más eliminación de barreras</i> |
| 5 | Change required for improvement; total lack of accessibility <i>Canvi a nivell de millora. Manca total d'accessibilitat</i> |
| 6 | I would require rationalization in the application of the rules: stairs as the access of a building and then an indoors ramp; bathrooms being considered "adapted" just because they have a handle in the toilet, but none in the shower, which requires standing and has no seat; highly slippery pavement in sports centres (e.g., around the pool), only because it is more durable over time. All these I find in buildings that are officially recognized with the category of "adapted" <i>Exigiría racionalización en la aplicación de las normas: escalones de acceso a edificios y, en cambio, rampa interior; baños "adaptados" sólo porque tienen una barra en el inodoro, pero ninguna en la ducha que exige bipedestación y carece de asiento; pavimento en polideportivos altamente deslizantes, i.e. alrededor de la piscina, sólo porque es más resistente a lo largo del tiempo. Todo esto lo encuentro en edificios a los que se les ha reconocido oficialmente la categoría de "adaptado"</i> |
| 7 | I would demand the fulfilment of the existing rules, for example access to bars, shops, restaurants, hotels with suitable adapted rooms, etc. <i>Haría que (en primer lugar) se cumpliera la normativa existente, por ejemplo acceso a bares, tiendas, restaurantes, hoteles con habitaciones adaptadas adecuadas,</i> |
| 8 | Poor adaptation of public transport (e.g., Renfe), many streets in the city and shops. I can only go shopping in new commercial centres. <i>Transporte publico (renfe esta muy mal adaptada) calles de la ciudad el comercio, solo puedo ir a comprar a centros comerciales nuevos,</i> |
| 1c) | About how to approach accessibility |
| 1 | Seek more consensus on universal design, especially at the conflictive points where the accessibility needs for mobility-impaired users and the ones for people with sensory impairments collide. <i>Buscaría más consenso en cuanto al diseño universal, especialmente en los puntos donde chocan la accesibilidad para PMR y la accesibilidad para personas con deficiencias sensoriales</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|--|
| 1) | On general implementation |
| 1c) | About how to approach accessibility |
| 2 | <p>Explain, the designers that accessibility is not about installing a handle in a bathroom; accessibility is the study of the space to make it more comfortable for the person with reduced mobility, transfers, etc.</p> <p><i>Explicar, enseñar a los diseñadores del sector que la accesibilidad no es poner una barra en un baño, la accesibilidad es el estudio de ese espacio para que sea lo mas cómodo para la persona con movilidad reducida, transferencias etc.</i></p> |
| 3 | <p>I would especially like to see unified regulations (to prevent having one for each country, region, city, etc.) so that it is ensured that, when we say "something is accessible," everyone understands the same thing without need to specify.</p> <p><i>Sobre todo, unificaría las normativas (evitaría que hubiera una para cada país, comunidad autónoma, ciudad, ...) para garantizar que, cuando se hable de que "algo es accesible", todo el mundo entienda exactamente lo mismo por ello, sin necesidad de especificar</i></p> |
| 4 | <p>The regulations are very broad, specific and, in the end on paper, only theory and statement of good intentions, but what really counts is the true reality. By this I mean that a ramp is correct if it is accessible, useful and comfortable for use. If a ramp is made too steep, IT CAN NOT BE CONSIDERED AS ADAPTATION, it remains as a barrier. And this can be even worse, because where there is a barrier you can see it, but in wrong accessibility you can fall and it is worse: it is a trap. It is preferable to do less, but do it right and well supervised.</p> <p><i>Las normativas son muy amplias, específicas y al final, sobre el papel, solo teoría y declaración de buenas intenciones, pero lo que realmente cuenta es la autentica realidad. Con esto quiero decir que una rampa es correcta si es accesible, util y comoda para ser utilizada, si se hace una rampa excesiva, con bordillos y de mucha inclinación, NO SE PUEDE CONSIDERAR COMO ADAPTACIÓN, sigue siendo una barrera, y según como puede ser peor, porque donde hay una barrera ya lo ves, pero en una accesibilidad mal planteada puedes caer y es peor, son una trampa. Es preferible que se haga menos, pero correctamente y bien supervisado.</i></p> |
| 5 | <p>Someone should sit on a wheelchair so that especially the ramps on sidewalks are in good condition</p> <p><i>Que haya alguien que vaya en silla para que sobre todo las rampas de las aceras las dejen en condiciones</i></p> |
| 6 | <p>Sit architects in a wheelchair, then they would handle buildings and adaptations properly</p> <p><i>Que los arquitectos se sienten en una silla y así harían bien las obras y reformas</i></p> |
| 7 | <p>I lived in several countries and in my country I contributed to informing those who make the rules how to realize projects and by sharing my personal experiences</p> <p><i>Viví en varios países y en el mío contribuí a informar a quienes hacen las reglas alcanzando proyectos y compartiendo mis experiencias personales</i></p> |
| 2) | On demanding greater accessibility |
| 2a) | In new public buildings |
| 1 | <p>Should be mandatory for all types of businesses and public places, especially the newly created (it should be required to get a municipal license)</p> <p><i>Deberían ser obligatorias para todo tipo de comercios y lugares públicos, especialmente los de nueva creación (debería exigirse para dar la licencia municipal)</i></p> |
| 2 | <p>That all new construction be fully adapted</p> <p><i>Que todo lo de obra nueva estuviera totalmente adaptado</i></p> |
| 3 | <p>Require all public property to be adapted for disabled guests</p> <p><i>Obligar a todo establecimiento público que esté adaptado para personas con movilidad reducida</i></p> |
| 4 | <p>Accessibility in new construction must be mandatory</p> <p><i>Obligación accesibilidad obra nueva</i></p> |
| 2b) | In existing public buildings |
| 1 | <p>Public buildings, despite the fact of being ancient places, must be adapted as much as possible.</p> <p><i>Que aunque fueran locales antiguos les obligaran, en la medida de lo posible, al ser locales públicos estar adaptados</i></p> |
| 2 | <p>Mandatory adaptation for all public buildings within a time limit</p> <p><i>Obligatoriedad de adaptación para todos los locales públicos en un límite de tiempo</i></p> |
| 3 | <p>Lifts for old buildings</p> <p><i>Hissit vanhoihin rakennuksiin</i></p> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|--|
| 2) | On demanding greater accessibility |
| 2b) | In existing public buildings |
| 4 | Public spaces must be barrier-free. In Seinäjoki, my city, I do not have the opportunity to visit the movie theatre because of the spiral staircase. Its adaptation has been promised, but just at the speech level <i>Julkisten tilojen tilat tulee olla esteettömiä. Kaupungissani seinäjoella ei ole mahdollisuutta käydä elokuva teatterissa kierreportaiden takia. Asialle on luvattu tehdä muutosta, mutta jäänyt vain puheen tasolle</i> |
| 5 | Access to routine shops and not only multinational businesses must be more accessible <i>Entrada a locales del día a día más accesibles no solo multinacionales.</i> |
| 6 | Persevering in adaptation (of the built environment) <i>Perseverar en adaptaciones</i> |
| 7 | Accessible shops <i>Establecimientos accesibles</i> |
| 8 | Forcing adaptation of bathrooms <i>Obligar a la adaptación de baños</i> |
| 9 | More barrier-free entrances <i>Esteettömiä sisäänkäyntejä enemmän.</i> |
| 2c) | In public space |
| 1 | Improve the ramps of the pedestrian crossings: the old ones are not smooth enough and instead have a small step, which is fatal if you're in a wheelchair (I am an electric wheelchair user) <i>Milloraria les rampes dels carrers: les més velles no acaben llises, sino que fan com un graonet, això és fatal si vas en cadira (jo vaig en cadira elèctrica)</i> |
| 2 | In the same way that the bike paths are indicated, why not also indicate the sidewalk ramps at pedestrian crossings? <i>Al igual que está marcado el carril bici, por que no las bajadas de las aceras también esa señalización.</i> |
| 3 | I would like the sidewalks to be at the same level as the road in order to not have to climb that sometimes impossible step; fewer slopes and more promenades so we can walk around the city. One more idea, I would eliminate all stairs <i>Me gustaría que las aceras fueran a ras del suelo para no tener que subir ese escalón que a veces es imposible, menos cuestas y más paseos para que podemos pasear por la ciudad. Como uno más, eliminaría todas las escaleras</i> |
| 4 | Full access in beaches for the greatest autonomy in swimming. Sufficient parking spaces reserved for the disabled. Thorough monitoring of the parking cards. Applications of GPS for locating the parking reserved for the disabled <i>Acceso completo para la mayor autonomía posible al baño en las playas. Plazas suficientes de aparcamiento reservadas. Control exhaustivo de la tarjetas de aparcamiento. Aplicaciones sobre gps para localizacion de las plazas reservadas</i> |
| 5 | Forcing adaptation of sidewalks <i>Obligar a la adaptación de aceras</i> |
| 6 | I would revise all the cobbled pavements and the ramps of the pedestrian crossing, as well as the maintenance of the street pavement because it detaches in short time and one stumbles on it. <i>Revisaría todo lo que son los empedrados y los vados para sillas de ruedas, así como el material que se pone en las calles porque en poco tiempo se desprende y uno se va tropezando en él.</i> |
| 7 | Periodic inspection and, if necessary, repairs of sidewalks and asphalt streets. <i>Control periódico y arreglo si hace falta del asfalto de las aceras y las calles.</i> |
| 2d) | In transportation (public transport and private vehicle) |
| 1 | Accessibility to all public transport <i>Accesibilidad en todos los transportes públicos</i> |
| 2 | Parking zones, more accessibility in the metro <i>Aparcamiento en aceras, acceso a los metros</i> |
| 3 | Parking zones, more accessibility in the metro <i>Zonas para aparcar, más accesibilidad en el metro</i> |
| 4 | Buses without stairs in order to access the seats <i>Buses sin escalones para acceder a los asientos</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|--|
| 2) | On demanding greater accessibility |
| 2d) | In transportation (public transport and private vehicle) |
| 5 | The entire platform length in the metro must be adapted; if a lift doesn't work in one station, it must be announced by loudspeaker <i>Metro: andana tota adaptada; Ascensors: avisar per megafonia si un ascensor no funciona en una estació</i> |
| 6 | Public transport (Barcelona) remains in some areas quite complicated or impossible <i>Transporte público (Barcelona) sigue siendo en algunas zonas bastante complicado o imposible</i> |
| 7 | With regard to accessible parking spaces. <i>Con respecto a plazas de aparcamiento.</i> |
| 3) | Specific complaints |
| 3a) | Disagreement with regulations |
| 1 | Remove kerb access to residential buildings, bars, and other commercial spaces, since a few cm are permitted. Also remove the legislation that states adaptation is necessary only if there are a determined number of square meters <i>Sacar los bordillos de los accesos a viviendas, bares, locales, ya que está permitido unos cm. También sacar la normativa que sólo se tiene que adaptar si tiene tantos metros cuadrados</i> |
| 2 | Accesses must be at the same level, 12cm steps are unacceptable since they are impractical for autonomy <i>Accesos a cota 0, res d'acceptar graons de màxim 12 cm., és impracticable autònomament.</i> |
| 3 | To facilitate access to housing, in my case it is impossible: I have a single entry step that is 18 cm high, and it is a new building <i>Facilitar el acceso a la vivienda, en mi caso lo tengo fatal y tengo un solo escalón de entrada de 18 cm de alto en una casa nueva</i> |
| 4 | The gaps of the street can have a maximum height of a few centimetres (according to the rules) and I do not think there should be steps in the streets, shops, restaurants, etc. These differences in height prevent access for people who use a wheelchair <i>Els desnivells del carrer poden tenir una alçada màxima d'uns centímetres (segons la normativa) i considero que no hi hauria d'haver desnivells en la via pública, botigues, restaurants... Aquests desnivells impedeixen l'accés a les persones que van amb cadira de rodes</i> |
| 5 | Lifts, hallways and doors that are wide enough for at least 2 people to pass comfortably (one beside the other) <i>Ascensores, pasillos y puertas anchos dónde pasen cómodamente al menos 2 personas (una al lado de la otra)</i> |
| 3b) | About ramps too steep |
| 1 | Most shops and restaurants are not adapted or are poorly adapted with ramps that are useless (I call them launchers), generally most ramps in buildings are not practicable <i>La mayoría de comercio y restauracion no está adaptada o mal adaptada con rampas que no sirven de nada (yo les llamo rampas de lanzamiento) edificios en general la mayoría de rampas no son practicable</i> |
| 2 | Sometimes, the ramps for accessing the shops or other premises cause vertigo or are badly done, like in most of the buses, but they are not rectified because it is assumed that the adaptation is already done; but adapted for whom? <i>A veces, las rampas de los locales son de vértigo o están mal hechas como las de la mayoría de los autobuses, pero no las modifican porque se supone que la adaptación está hecha, pero adaptado ¿para quién?</i> |
| 3 | Ramps less steep <i>Las rampas menos empinadas</i> |
| 4 | Despite my limited knowledge, many stairs have the handrail on only one side and the ramps are too steep. <i>Todo y mi reducido conocimiento, en muchas escaleras la barandilla está sólo a un lado y la rampa es demasiado empinada.</i> |
| 5 | Ramps are too steep. Handles should be bigger, sometimes it is hard to grab them <i>Rampit ovat liian jyrkkiä. Kahvat pitäisi olla suurempi, joskus on vaikea napata ne</i> |
| 6 | Lower ramp slopes <i>Ramppien kaltevuudet pienemmäksi ym</i> |
| 7 | Change the slope of the ramps for the disabled <i>Modificar la pendiente de las rampas para minusvalidos</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|--|
| 3) | Specific complaints |
| 3b) | About ramps too steep |
| 8 | Ramps for access to shops, in addition to landings <i>Rampes per accedir a botigues, a més del replà</i> |
| 3c) | About public toilets |
| 1 | All public buildings must have adapted wc <i>Que todos los establecimientos públicos tengan wc adaptado</i> |
| 2 | More accessible public toilets <i>Más baños públicos accesibles</i> |
| 3 | Toilets for the disabled <i>Inva wc</i> |
| 4 | Prohibition of stairs to access the toilets in public buildings <i>Prohibición de escaleras para acceder a los servicios en locales públicos</i> |
| 5 | Many times the facilities are adapted but dirty. It would be ideal to have a disinfectant dispenser and paper in order to clean up a bit before using the toilet <i>Muchas veces el servicio está adaptado pero sucio. Sería ideal que hubiera un dispensador de desinfectante y de papel para así poder limpiar un poco el váter antes de usarlo</i> |
| 6 | Toilets in public places do not always have the necessary height <i>Los sanitarios de los lugares públicos no siempre tienen la altura necesaria</i> |
| 7 | Accessible toilets must be unisex, as I need to go accompanied; it is not good if they are in the bathrooms for men or women <i>Servicios adaptados unisex ya que necesito ir acompañado, no dentro de los hombres o mujeres</i> |
| 3d) | About hotels |
| 1 | Many hotels confuse adapted with accessible, offering rooms that are not good for all disabled, so you can never trust a specification marked in their services. Sometimes, solutions that are too "contrived" are applied in buildings to make them accessible, to the point that they are too complex and usually end up being unusable (surely as a result of bad advice) <i>Numerosos hoteles confunden adaptado con accesible, ofreciendo habitaciones que no son aptas para discapacitados, por lo que no puedes nunca fiarte de las especificaciones que marcan en sus servicios. En ocasiones se ven edificios con soluciones demasiado "rebuscadas" para convertirlos en accesibles, ofreciendo soluciones que a veces de tan complejas suelen acabar siendo inutilizables (producto seguramente de mal asesoramiento)</i> |
| 2 | Hotels with accessible rooms and bathrooms <i>Hoteles con habitaciones y baños accesibles</i> |
| 4) | Others: ethics, awareness, reflections. |
| 1 | People should have more awareness of the limitations of many of us. Not out of pity, that's the last thing we need. <i>Que la gente se conciencie de las limitaciones de muchos de nosotros. No por lástima, eso lo último.</i> |
| 2 | Accessible construction would benefit all! <i>Esteetön rakentaminen olisi kaikille eduksi!</i> |
| 3 | Please stop saying once and for all that the metro and the bus, at least in Barcelona, are adapted, because THEY ARE NOT, until a person with reduced mobility can TRAVEL ALONE, it won't be accessible <i>Por favor que dejen de decir de una vez por todas que el metro y el autobus, por lo menos en Barcelona, estan adaptados, porque NO LO ESTAN, mientras que una persona con movili-dad reducida pueda VIAJAR SOLA, no lo estará</i> |
| 4 | The lift in a shopping centre or in a metro station should only be allowed to be used by people in wheelchairs or using strollers <i>Que sólo pudieran cojer el ascensor de metro o centros comerciales personas en silla de ruedas o cochecitos</i> |
| 5 | Yes, if I could I would change the way the world is designed, otherwise, it is a lost battle that, since I won't let it influence me, I abstain from any nonconformity, the famous phrase of DEAL WITH IT. Hehee! <i>Sí, cambiaría si pudiera la forma en que está ideado el mundo, por lo demás, es una batalla perdida que como no dejo que me influya, me abstengo de cualquier inconformidad, la famosa frase de AJO ...Y AGUA..... JEJEE!!</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBILITY REGULATIONS?" | |
|--|---|
| 4) | Others: ethics, awareness, reflections. |
| 6 | 50% OF THE SUBSIDIES should not be combined with the finances of the applicant, this would avoid a gradual economic reduction in people with high dependency <i>EL 50% DE LAS AYUDAS no tendría que mezclarse con el patrimonio del solicitante, así se evitaría una progresiva reducción económica en personas con gran dependencia</i> |
| 7 | I would try to design a device so that disabled people could stand or move upright without the need of a wheelchair, a kind of robot <i>Trataría de diseñar un aparato para poder hacer que la personas discapacitadas puedan estar en pie, trasladarse erguidos sin necesidad de sillas de ruedas, una especie de robot</i> |
| 8 | Difficult communication <i>Difícil comunicació</i> |

Source: Own elaboration based on PRM surveys

B.4.3.2. Regulations – Toilets:

Table B.15: Classification of answers regarding "Would you add anything to accessible sanitary facilities design?"

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|---|
| 1) | On toilet's complements |
| 1a) | General complements |
| 1 | The soap dispenser, clothes hooks, hand dryer or hand towels should be placed lower. <i>El dispensador de jabón, las perchas, el secador de mano o las toallas para secarse deben estar colocados más bajos.</i> |
| 2 | Put clothes hooks at 1.50m height to hang the jacket <i>Pongan colgadores a una altura de 1,50 para colgar chaqueta</i> |
| 3 | Mirror at the proper height, reduced siphon or built within the wall <i>Mirall a l'alçada adequada, sífó reduït o empotrat a paret</i> |
| 4 | The mirror height and a trash container are also requirements for accessibility, please this must be expressed in architectural studies, to decorators etc. <i>Si la altura de espejo y la basura también tienen que ser accesibilidad, por favor que esto se diga a los estudios arquitectónicos, decoradores etc.</i> |
| 5 | For example clothes hooks, they seem to be designed only for the summer. It seems silly but it is not. This Christmas, the service area in the toilets for the disabled had no place to hang a jacket <i>Por ejemplo que haya colgadores para la ropa, parecen diseñados para el verano. Parece una tontería pero no lo es. Estas navidades en los aseos para minus de las areas de servicio no había donde colgar la americana</i> |
| 6 | Automatic dryers should be lower, so that they could be indeed reached <i>Automaattikuivaajat alemmas, niin, että niihin voisi joskus ihan yltääkin</i> |
| 7 | One could consider in more detail that the paper towels, etc. are indeed at the right height. Also, in some cases, the soap should be placed more accessibly. <i>Voisi katsoa tarkemmin, että käsipaperit / pyyhkeet ym. ovat oikealla korkeudella. Myös saippuan voisi joissain tapauksissa laittaa helpommin saataville.</i> |
| 8 | Toilet mirrors should be placed in such a way that it is possible to see oneself at a seated height. This certainly applies also to the soap dispenser, the hand towels and the coat hooks, which are mainly installed at a standing height. <i>WC-peilit tulisi sijoittaa siten, että niistä näkee itsensä myös istumakorkeudelta. Tämä kyllä pätee niin saippua- kuin käsipaperitelineisiin ja vaatekoukkuihinkin, jot-ka pääosin asennetaan seisomakorkeudelle.</i> |
| 9 | Towels or dryers placed lower! <i>Pyyhkeet tai kuivatus alemmaksi!</i> |
| 10 | Wall hooks (are a problem) <i>Seinäkoukkuja</i> |
| 11 | It would be ideal to have a lifting device <i>Sería ideal disponer de grúa</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|---|
| 1) | On toilet's complements |
| 1a) | General complements |
| 12 | automatic tap water <i>automaattinen vesijohtovettä</i> |
| 1b) | Grab bars |
| 1 | Removing the grab bar from where we place the wheelchair bothers me a lot <i>Sacar la barra del sitio donde ponemos la silla molesta mucho</i> |
| 2 | Sometimes the grab bars are not properly positioned <i>A veces las barras de apoyo no están colocadas adecuadamente</i> |
| 3 | The grab bars should have a certain distance from the wc to the wall, so you can get leverage for pulling your pants up (if it is too close you cannot get leverage). The grab bars should be movable and not fixed to the floor, in order to make space for transferring to the wc. <i>Que las barras tengan una distancia del water a la pared donde poder hacer palanca para subirse los pantalones (si está muy cerca no puedes hacer la palanca). Que las barras sean abatibles y no pegadas al suelo, que quitan espacio para colocarte.</i> |
| 4 | It is necessary to study where the grab bars will be installed. <i>Hay que estudiar qué puntos de apoyo se van a instalar.</i> |
| 5 | Sometimes there is just a single grab bar <i>A veces només una barra</i> |
| 6 | Grab bars <i>Kahvoja</i> |
| 7 | The grab bars are placed 1meter distance or in such a way that they end up being useless <i>Las barras de apoyo a un metro de distancia o puestos de tal manera que acaban siendo obsoletos</i> |
| 8 | Decent grab bars (some do not stay up and fall over, or are otherwise in poor condition)! <i>Kunnolliset tukikaiteet (on niitakin, jotka pettävät alta tai muuten huonokuntoiset)!</i> |
| 1c) | WC lifter / WC height |
| 1 | In most cases, the booster seat is a whole piece and it is not easy when using the toilet paper, it would be better to have a booster seat with a lateral opening easily introducing the hand. <i>En la mayoría el alzador es de una pieza entera y no me es fácil a la hora de usar el papel higiénico, sería mejor un alzador con hueco lateral para meter bien la mano.</i> |
| 2 | The WC height should be 60cm (I think), it should be at the same height of the wheelchair to make the transfer more easily <i>La altura del WC fuera 60 cm (creo), estuviera a la altura de una silla para realizar las transferencias con más facilidad</i> |
| 3 | Put a lifter for the toilet seat <i>Colocar alces al water</i> |
| 4 | WC height similar to the wheelchair <i>Altura del wc similar a la silla de ruedas</i> |
| 5 | The toilet seat should be higher <i>Que los vateres fueran más altos</i> |
| 6 | They (toilet seats) are too high in some cases <i>Son demasiado altos en algunas casos</i> |
| 7 | They (toilet seats) shouldn't be too low <i>Que no sean muy bajos</i> |
| 8 | Toilet seats are too low <i>WC-istuimet ovat liian alhaiset</i> |
| 1d) | Toilet paper / Bidet location |
| 1 | Disposable towels or absorbent napkins <i>Toallas desechables o servilletas absorbentes</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|---|
| 1) | On toilet's complements |
| 1d) | Toilet paper / Bidet location |
| 2 | Easy access to the toilet paper, and easy to remove. <i>Fácil acceso al papel higiénico, y que sea fácil de sacar.</i> |
| 3 | The toilet paper should be closer to the toilet, so that it is not necessary to stretch, because for some it is impossible. <i>Että wc-paperit olisivat lähempänä wc-pönttöä, ettei tarvitsisi kurotella, sillä joillekin se on mahdotonta.</i> |
| 4 | Toilet paper and hand tissues should be placed in such a way that they can be easily reached and used. <i>Wc-paperit ja käsipaperit tulisi sijoittaa, siten, että niitä voi käyttää helposti paikaltaan ja niihin yltää helposti</i> |
| 5 | Toilet paper is sometimes hard to get <i>WC-paperi on joskus vaikea saada</i> |
| 6 | Toilet paper is often too far away <i>WC-paperi on usein liian kaukana</i> |
| 7 | The handle of the bidet shower should be designed so that it is not necessary to stretch the hose, it should be within hand's reach when in the sitting position, and it should not be necessary to rise. <i>Bide-suihkun kahvan tulisi ylettää wc-pöntölle letkun kiristymättä, sille pitäisi olla teline käden ulottuvilla pöntöllä istuttaessa ja se pitäisi myös saada päälle ja pois nousematta pöntöltä</i> |
| 8 | The toilet paper within the reach of the hand! <i>Wc-rullat käden ulottuville!</i> |
| 9 | Thinking of female customers: In many disabled toilets bidets are just next to the washbasin, and often too far from WC. <i>Harkitsetko naisasiakkaat: Monissa inva-wc bidee ovat aivan vieressä pesuallas, ja usein liian kaukana WC.</i> |
| 2) | On general design |
| 2a) | About space |
| 1 | They (accessible toilets) are often too small <i>són petites</i> |
| 2 | More space and more rational layout <i>Enemmän tilaa ja järkevämpi asioiden sijoittelu</i> |
| 3 | They should be bigger <i>Que fueran más grandes</i> |
| 4 | Often the space (is a problem) <i>Usein tilaa</i> |
| 2b) | About showers and changing rooms |
| 1 | They should be improved, especially for bathing/taking a shower <i>Deberían de mejorar sobre todo para bañarse</i> |
| 2 | In places like gyms, it would be very nice to have some kind of stretcher. <i>En lugares como gimnasios estaría muy bien algún tipo de camilla.</i> |
| 2c) | About doors and thresholds |
| 1 | We should also think about the doors and thresholds, and not just toilets. <i>Pitäisi miettiä myös ovia ja kynnyksiä, eikä vain wc-tiloja.</i> |
| 2 | Handles in doors (to help closing them) <i>"vetokaiteet" oveen</i> |
| 3 | Spring door closers make doors too heavy to open, I do not think that such mechanisms should be installed (especially in the toilets for the disabled), fortunately, it is not very common. <i>Ovipumpulliset (tms.?) ovet ovat välillä turhan painavia avata eli invavessojen oviin ei mielestäni sellaisia kannata asentaa, onneksi se ei ole kovin yleistä.</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|--|
| 2) | On general design |
| 2d) | General design approach |
| 1 | They should be designed by the users <i>Deberían diseñarlos los que los usuarios</i> |
| 2 | Designers should be informed and not install grab bars or aid elements anywhere. <i>Que cuando lo realicen se informen y no pongan los barrales o las ayudas en cualquier sitio.</i> |
| 3 | Spaces should be cared for and respected, and if they are made new, they should be designed to be, in the appropriate measures, comfortable spaces <i>Que se cuiden y respeten los espacios, y que si se hacen de nuevos, se procure, en las medidas adecuadas, crear espacios cómodos.</i> |
| 3) | On general management |
| 3a) | About how toilets are closed by key and/or used as storage room |
| 1 | The accessible toilets are often used as storage.. <i>En muchas ocasiones utilizan los aseos adaptados como almacén.</i> |
| 2 | As the accessible toilets are bigger, they are normally used as storage and are then difficult to access <i>Normalmente al ser de mayor capacidad los usan de trastero y luego es de difícil acceso</i> |
| 3 | At motorway areas, accessible toilets are very often closed, so I have to go back to the entrance and ask for the key; in these cases, I usually find them as storage rooms full of the most varied objects. <i>En áreas de servicio de autopistas es muy frecuente encontrarlos cerrados, por lo que tengo que volver a la entrada a solicitar la llave; en estos casos, me los encuentro utilizados como almacenes de los más variados objetos.</i> |
| 4 | Sometimes they are well designed but wrongly used because they serve as storerooms where items are accumulated, which end up hindering mobility and the key often has to be requested from many meters away. <i>Algunas veces están bien diseñados pero mal utilizados porque sirven de almacén donde acumulan objetos que acaban dificultando la movilidad y la llave suele tener que pedirse a muchos metros de distancia.</i> |
| 5 | It would be very interesting to introduce in Spain and in other European countries the Eurokey, an initiative that has been used for years in Germany, Austria and Switzerland to ensure hygiene and the proper use of public toilets (also for those public toilets within a private institution). It is a key that any person who proves his/her disability may acquire and with it—once established and extended—he/she can use any public service without finding it messy or having to ask somebody to open it. <i>Sería muy interesante introducir en España y otros países Europeos la Eurollave, una iniciativa que lleva años usándose en Alemania, Austria y Suiza para garantizar la higiene y correcto uso de los servicios higiénicos públicos (se entiende también los que estén destinados al público gral. dentro de una institución privada). Se trata de una llave que cualquier persona que acredite su discapacidad puede adquirir y con ella -una vez instaurado y extendido- puede usar cualquier servicio público sin tener que encontrárselo descuidado o pedir que se lo abran.</i> |
| 6 | They should not be closed by key <i>Que no estuvieran cerrados</i> |
| 7 | They should not seem like a storage room <i>Que no semblen un magatzem</i> |
| 8 | Accessible toilets normally locked by key and with no instructions where to go /who to ask to open them. Accessible toilets completely separated from the rest , when certain facilities could be integrated with others for non-disabled people. <i>Servicios normalmente cerrados con llave sin instrucciones a quien acudir para abrirlos. Servicios completamente apartados de los demás servicios, cuando se podría unificar el uso de ciertas instalaciones con personas no discapacitadas.</i> |
| 9 | Any excess of junk out of the toilets for the disabled! <i>Kaikki ylimääräinen roju pois inva-wc:ista!</i> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|---|
| 3) | On general management |
| 3a) | About how toilets are closed by key and/or used as storage room |
| 10 | <p>In the design of accessible toilets, it is better to integrate them with the rest and not to have them segregated and locked by key (they become a cleaning storeroom filled with junk); it is best if they are together with those of other people, to facilitate integration at all levels. Secondly, the sign should say "priority to the disabled" and thus not exclude others who want to use them too, but they must be aware to give priority if someone with a wheelchair or with crutches needs to use it.</p> <p><i>El diseño de servicios higiénicos accesibles es mejor ponerlos integrados al resto y no segregados y bajo llave (se convierten en almacén de limpieza y se llenan de trastos) Mejor con el resto de personas para facilitar la integración en todos los ámbitos, 2º en la etiqueta debería poner preferencia a los discapacitados y así no se excluye a los que andan, estos los pueden utilizar también, pero conscientes en dejar preferencia en caso de presenciar alguien con silla o muletas</i></p> |
| 3b) | About safety, maintenance, and hygiene |
| 1 | <p>A sign on the door of 'occupied' or 'free' to identify if it is busy without having to close the door latch. I do not close the latch for fear of falling and not being able to get help. System for asking help</p> <p><i>Un cartelito en la puerta de ocupado o vacío para identificar que está ocupado sin tener que cerrar el pestillo. Yo no cierro el pestillo por miedo a caerme y no poder pedir ayuda. Sistema para pedir ayuda</i></p> |
| 2 | <p>Please doors opening outwards!!!!!!</p> <p><i>Que por favor las puertas se abran hacia fuera!!!!!!</i></p> |
| 3 | <p>It is customary to find many out of order, unavailable</p> <p><i>Que te encuentras muchos estropeados fuera de servicio.</i></p> |
| 4 | <p>Hygiene (usually very bad), the use of facilities by people who do not need it, etc.</p> <p><i>Desde la higiene (normalmente muy mala), el uso de los servicios por personas que no lo necesitan, etc</i></p> |
| 5 | <p>I doubt that some toilets can be used safely, I usually observe weak anchorings, missing screws, etc.</p> <p><i>Algunos servicios dudo que puedan ser utilizados de forma segura, suelo observar anclajes débiles, falta de tornillos, etc.</i></p> |
| 6 | <p>Toilet seat cleaner available!</p> <p><i>Wc-renkaan puhdistusaine saatavilla!</i></p> |
| 7 | <p>Hand sanitizer in the accessible toilets available because it is used by a very wide range of people (many have very limited functions), so the outcome is that the toilet seat is not in a very clean condition.</p> <p><i>käsidesiä koska esteettömissä vessoissa käy hyvin monenlaisia ihmisiä (monet pystyvät toimimaan todella rajoitetusti) joten kaikkien jäljiltä wc-istuin ei ole kovin siistissä kunnossa.</i></p> |
| 4) | Others: ethics, awareness, reflections. |
| 1 | <p>Personally, I've always wondered how the hell (pardon the expression) the accessible toilet in El Corte Inglés (Barcelona) is used. It rather looks like a cyber torture machine...</p> <p><i>Y a modo personal, siempre me he preguntado cómo narices (perdón por la expresión) se usa el wc adaptado del El Corte Inglés (Barcelona), parece más bien una máquina de tortura cibernética...</i></p> |
| 2 | <p>I currently live in Coma-ruga, but I've lived all my life in Barcelona and I must remark that many public places and even some railway lines have improved a lot in accessibility terms, not only in toilets but also in transportation. Although there is still much to do.</p> <p><i>Yo actualmente vivo en Coma-ruga. pero he vivido toda mi vida en Barcelona y he de remarcar que muchos locales públicos e incluso alguna línea de tren han hecho mucho por la accesibilidad, ya no solo en lavabos sino también en Transporte. Aunque aun faltan.</i></p> |
| 3 | <p>In Italy the rules must be stricter, because it is easy to find accessible toilets even in the most theoretically inaccessible places.</p> <p><i>En Italia la normativa debe de ser más dura porque es fácil encontrar baños accesibles incluso en los lugares más teóricamente inaccesibles.</i></p> |
| 4 | <p>They (accessible public toilets) must be mandatory</p> <p><i>Que sean obligatorios</i></p> |
| 5 | <p>They are very generic and not at all specified for some people</p> <p><i>Son muy genéricos y no son nada específicos para algunas personas</i></p> |

| "WOULD YOU ADD ANYTHING TO ACCESSIBLE SANITARY FACILITIES DESIGN?" | |
|--|--|
| 4) | Others: ethics, awareness, reflections. |
| 6 | Despite being labelled as 'accessible', many of them are not <i>Que muchos no son "accesibles" como hacen constar</i> |
| 7 | Go for it opariin <i>Tsemppiä opariin</i> |

Source: Own elaboration based on PRM surveys

B.4.3.3. Perception:

Table B.16: Classification of answers regarding "Are you satisfied with the accessibility of your current home?"

| "ARE YOU SATISFIED WITH THE ACCESSIBILITY OF YOUR CURRENT HOME?" | |
|--|--|
| 1) | On home satisfaction |
| 1a) | NOT satisfied (although they had move to a new 'more accessible' place or have rehabilitated their home) |
| 1 | The interior of my house is all right but the accessibility in the building is relative. It was built in 2000 and therefore meets (or should meet) the standards currently in force. You might say that it is accessible, but it does not seem right to me that to access my block I have to enter through the community garden because there are 6 steps in the main entrance. When a friend is in a wheelchair, he/she has to call me on the phone (it is not even possible to access the intercom because it is at the top of the 6 mentioned steps) and, in addition, I have to go down to the garden to open the gate because there is no intercom there. What's more, the elevator does not reach the top, thus I cannot access the roof (the upper community terrace where people can hang clothes and where the air conditioners are) <i>En el interior de mi vivienda está todo correcto pero en el edificio la accesibilidad es relativa. Es una comunidad construida el año 2000, con lo cual cumple (o debería cumplir) con la normativa vigente en ese momento. Digamos que es accesible, pero no me parece correcto que para acceder a mi bloque tenga que entrar por el jardín comunitario porque en que la entrada principal hay 6 escalones. Cuando viene algún amigo en silla de ruedas, tiene que llamarme por el móvil (él no puede acceder tansiquiera al interfono porque está arriba de los 6 escalones) y además tengo que bajar a abrir la puerta del jardín porque allí no hay portero automático. A parte, el ascensor no llega arriba del todo, con lo cual no puedo acceder al terrado (terrazza superior comunitaria donde la gente puede tender la ropa y donde están los aparatos de aire acondicionado)</i> |
| 2 | My wheelchair scrapes against things all over the place <i>Rozo con la silla en todas partes</i> |
| 3 | An appropriate ramp is missing in the building entrance, the doors in the house are too narrow <i>Falta rampa adecuada en la portería, las puertas de casa son estrechas</i> |
| 4 | Rehabilitation would be needed in the kitchen, especially. <i>Necesitaría reformas en la cocina, sobre todo.</i> |
| 5 | I do not live in an accessible place ... I have unevenness, narrow doorsbut I do not care, I have no choice! Adapt or die! <i>No vivo en un sitio adaptado...tengo resaltes,puertas estrechas,....pero me da igual, no tengo opción!! adaptarse o morir!</i> |
| 6 | Because I live on the 5th floor with no elevator and that hinders the possibility of leaving the house by myself <i>Porque vivo en un 5 piso sin ascensor y eso limita que yo pueda salir de casa sola</i> |
| 7 | One step to get in the house and a ramp indoors <i>Un escalón en la entrada y una rampa dentro de casa</i> |
| 8 | I cannot get out by myself from my bedroom nor go to the bathroom without help. <i>No puedo salir sin ayuda de mi cuarto y tampoco al servicio.</i> |
| 9 | The building code is not respected. The problem lies in the lack of essential accessibility teaching in schools of architecture and among professionals in architecture <i>No se respeta el código en la construcción, el problema deriva de la ausencia de asignatura imprescindible de accesibilidad en la carrera-facultades/profesionales de arquitectura</i> |

| "ARE YOU SATISFIED WITH THE ACCESSIBILITY OF YOUR CURRENT HOME?" | |
|--|---|
| 1) | On home satisfaction |
| 1a) | NOT satisfied (although they had move to a new 'more accessible' place or have rehabilitated their home) |
| 10 | It would be necessary to enlarge the cabin space of the elevator, the doors of the building should be replaced by smoother ones without a return spring, which hinders their opening from the outside, and little else. <i>Sería necesario ampliar espacio del ascensor; substituir las puertas del edificio por unas más suaves y sin muelle de retorno que me impiden abrirlas desde fuera y poco más.</i> |
| 11 | I cannot get out with the wheelchair independently (too steep ramp to the self-opening doors, while the other outer door is not automatic, which could be the way to get out without any help) <i>En pääse itsenäisesti ulos pyörätuolillani (liian jyrkkä luiska itsestään aukeavien ovien ulkopuolella ja toinen ulko-ovi ei aukea itsestään, josta puolestaan olisi mahdollista muuten päästä pt:lla ulos ilman apuja)</i> |
| 12 | Accessibility and easy movement could have been a little better, I'll have to think about some crawling, for instance, to get in the shower <i>Esteettömyyttä ja helppoa liikkumista oltaisiin voitu miettiä vähän paremmin joudun jonkin verran konttaamaan sisätiloissa menessäni esimerkiksi suihkuun</i> |
| 13 | A couple of thresholds must be removed and the ramp at the front door is too steep for a wheelchair. In addition, more handrails are needed. <i>Pari kynnystä täytyisi poistaa ja ulko-ovella oleva pyörätuoliramppi on liian jyrkkä. Myös tukikahvoja tarvitsisin lisää.</i> |
| 14 | Smaller apartment before: 3h + k, and now: 1h + kk <i>Pienet tilat ennen 3h+k nyt 1h+kk</i> |
| 1b) | NOT satisfied with their current home, although they did move to a new place |
| 1 | The shower is not accessible, there are no grab bars on the walls to assist mobility <i>La ducha no es accesible, ni hay barras de movilidad por las paredes</i> |
| 2 | Narrow corridors <i>Pasillos estrechos</i> |
| 3 | We are poor and there is no comfort <i>Somos pobres y no hay comodidad</i> |
| 4 | Lack of accessibility in the common areas of the building <i>Falta accesibilidad al edificio</i> |
| 5 | Access doors to the terrace/balcony <i>puertas salidas terraza balcón</i> |
| 6 | Poorly adapted shower <i>ducha poco adaptada</i> |
| 7 | It's hard for me to get into the bathtub <i>em costa entrar a la banyera</i> |
| 8 | No lift <i>no hay ascensor</i> |
| 9 | Some things need to be adapted, like the kitchen cabinets. The doors should be widened from 70 to 90cm and make them sliding. Remove the step in the shower. The sink in the bathroom should be removed because there is a cabinet underneath that impedes the necessary legroom <i>Li falta adaptar coses, com els armaris de la cuina. Les portes les ha d'ampliar de 70 a 90cm i posar-les correders. Treure l'esglao per entrar a la dutxa. La pica del lavabo l'ha de canviar perquè té un armari sota que no li permet posar les cames bé</i> |
| 10 | The kitchen is not for me. I would need a wheelchair in the kitchen, because of the poor balance that I have I cannot work safely while standing, but I cannot use the chair because the kitchen counters cannot be lowered, so they are not designed for sitting. (I live in my childhood home still, but I'm going to live on my own to acquire a functional kitchen.) <i>Keittiö ei ole minulle sopiva. Tarvitsisin pyörätuolia keittiössä, sillä huonon tasapainon vuoksi en voi toimia seisten turvallisesti, mutta en voi käyttää tuolia, koska keittiössä keittökaapit/tasot eivät ole matalalla eikä sitä muutenkaan ole suunniteltu istuvan käyttöön. Asun vielä lapsuudenkodissani, mutta omaan asuntooni aion hankkia toimivan keittiön.)</i> |

| "ARE YOU SATISFIED WITH THE ACCESSIBILITY OF YOUR CURRENT HOME?" | |
|--|---|
| 1) | On home satisfaction |
| 1c) | SATISFIED with their current home, but adding some remarks |
| 1 | It is clear that I have integrally renovated the whole place <i>està clar que l'he reformada totalment</i> |
| 2 | Because I have renovated the place, although the doors do not allow the passage of a wheelchair <i>Porque me la he arreglado aunque las puertas no permiten el paso de una silla de ruedas</i> |

Source: Own elaboration based on PRM surveys

B.4.3.4. Last comments:

Table B.17: Classification of answers regarding "any other comments or remarks"

| "ANY OTHER COMMENTS OR REMARKS" | |
|---------------------------------|--|
| 1) | General comments |
| 1 | <p>If I have to travel, it is always with my husband because he adapts to my problems, it is impossible for me to make many excursions because there is not a single disability contemplated. The place where I feel more disabled is on the street, because I find many problems in wandering around and accessing places where there are endless stairs. I realize that I choose accessible places and no longer think about going to the non-accessible ones. I have the luck to live in an accessible home, we did it for my son who is tetraplegic and now it makes life easier for me. I also use a scooter to move on the street but I always encounter barriers, so I always go to the same places and I buy a lot online.</p> <p><i>Si tengo que viajar siempre es con mi marido ya que el se adapta a mis problemas, es imposible que pueda hacer muchas excursiones porque no se contempla ningún tipo de discapacidad. Donde más discapacitada me encuentro es en la calle ya que me encuentro muchos problemas para caminar y entrar a sitios donde hay escaleras interminables. Soy conciente de que elijo sitios adaptados y ya no me permito pensar en ir a los no adaptados. Tengo la suerte de tener una casa adaptada, la hicimos para mi hijo que es tetrapléjico y ahora me facilita la vida a mi. También uso un scooter para moverme por la calle pero siempre me encuentro con barreras y por eso siempre voy a los mismos sitios y compro mucho por internet.</i></p> |
| 2 | <p>It's been 35 years since I've been using a wheelchair and the changes have been astronomical in terms of accessibility and discrimination. Today I think that it is only limited to the economic capacity of individuals and countries. The consciousness is implemented, the laws are there and we need to implement them. For that, it is only a matter of money.</p> <p><i>Hace 35 años que utilizo una silla de ruedas y los cambios fueron astronómicos en cuanto a la accesibilidad y la discriminación. Hoy creo que sólo esta limitada a la capacidad económica de los individuos y de los países. La conciencia está implantada, las leyes están hay que ponerlas en marcha y para eso solo falta dinero.</i></p> |
| 3 | <p>Personally I do not think I am a good example, because I think about "disability" as an obstacle to personal development, a hard blow from which I must recover and once done, forget about it</p> <p><i>Personalment no crec que sigui un bon exemple, ja que considero la "invalidesa" aquesta com una trava al desenvolupament personal, un dur cop del m'he de recuperar i un cop fet, oblidar-me'n</i></p> |
| 4 | <p>Those of us who live in the mountains and are dedicated to it, we have no choice but to feel helpless in the face of nature, daily; nature cannot be adapted, so we suffer with whatever comes, because we have come to suffer. A hug!</p> <p><i>Los que vivimos en el monte y nos dedicamos a ello, no tenemos más opción que sentirnos impotentes ante la naturaleza, a diario, a la naturaleza no se la puede adaptar, así que, a sufrir con todo lo que venga, porque hemos venido a sufrir. Un abrazo!!</i></p> |
| 5 | <p>In the bathrooms, there are usually switches next to the door to turn the light on, which lasts about a minute. The ones who transfer to the toilet need more than a minute and we end up COMPLETELY IN THE DARK! The time should be reset or motion sensors installed. Regards Esteban</p> <p><i>En los baños, generalmente hay botones, al lado de la puerta, para encender la luz la cual dura aproximadamente un minuto. Los que hacemos transferencias al váter, tardamos más de un minuto y nos quedamos COMPLETAMENTE A OSCURAS!!! Se debería reprogramar el tiempo o colocar sensores de movimiento. Saludos Esteban</i></p> |
| 6 | <p>People are more aware and treat me well, and I get more help from young people.</p> <p><i>Está más concienciada y me trata y recibo más ayuda de la gente joven.</i></p> |

| "ANY OTHER COMMENTS OR REMARKS" | |
|---------------------------------|--|
| 1) | General comments |
| 7 | <p>Inconsistency in meeting the accessibility standards, e.g., it demands that a table should ensure a 70cm height underneath, to allow legroom. 95% do not meet this, even in public places like libraries, bars, restaurants, etc. But the problem is whoever makes tables so low, as a German speaker said "is it perhaps a privilege to have a coffee and to cross legs?" It is not possible because they are too low, for wheelchair users it is a necessity; it annoys us in many contexts that tables are so low. I hope I've helped, for more information here is my phone number. 9326646XX</p> <p><i>Incongruencia en llegar a cumplir el código accesibilidad, éste dicta que las mesas deben estar mejor con una altura 70-90 cm encima de las rodillas, el 95% No lo cumplen, incluso en espacios públicos como bibliotecas, bares, restaurantes, etc., pero el problema está en quien fabrica las mesas tan bajas, como decía un conferenciante alemán será acaso un privilegio tomar un café y cruzar piernas? No se puede porque son muy bajas, para los q vamos en silla es por necesidad nos fastidia en muchos contextos que las mesas sean tan bajas. Espero haber colaborado, para más información dejo mi telf. 9326646XX</i></p> |
| 8 | <p>The disability has not affected access to the place for studying. I have not yet experienced the labour market, but I am afraid that the employers' prejudices towards reduced mobility can make it difficult to get a job in the future. However, I'm not going to give up.</p> <p><i>Opiskelupaikan saantiin vammaisuus ei ole vaikuttanut. Työmarkkinoilta ei ole vielä kokemusta, mutta pelkään, että työnantajien ennakkoluulot liikuntarajoitteisuutta kohtaan vaikeuttavat työnsaantiani tulevaisuudessa. En aio kuitenkaan luovuttaa.</i></p> |
| 9 | <p>My cottage is actually disqualified from Porvoo. Here, if anywhere, officials and decision-makers are the biggest obstacle to barrier-free environment and housing permits!</p> <p><i>Asuinpaikkani on todella esteellinen porvoo. Täällä, jos missä virkamiehet ja päät-täjät ovat suurin este esteettömän ympäristön ja asumisen mahdollistamiseen!</i></p> |
| 10 | <p>New public spaces have been positively surprising because of how well the accessibility is now taken into account. Yet it is sometimes still forgotten that partial or full consultation with the users is needed, to choose the right solutions that are functional and suitable to the real space.</p> <p><i>On ollut uusissa julkisissa tiloissa positiivinen yllätys kuinka hyvin esteettömyys on (yritetty ottaa/) otettu nykyään huomioon. Tilojen suunnittelussa tuntuu välillä silti unohtuneen osittain tai kokonaan oikeiden käyttäjien kuuleminen ratkaisujen suunnittelussa oikeasti käytännölliseksi ja tilaan sopiviksi</i></p> |
| 2) | Thank you comments |
| 1 | <p>Let's see if someone can make life more accessible to people with disabilities. Good luck, we are with you, go Marta.</p> <p><i>A ver si por fin alguien puede conseguir una vida mas accesible para la gente con discapacidad. buena suerte estamos contigo arriba marta.</i></p> |
| 2 | <p>For any doubt that I may be useful in this regard, please do not hesitate to contact me, the issue of accessible design is a subject that attracts me every day more and more. I leave you my email. i.otazua@XXX.com Iñaki</p> <p><i>Cualquier duda que pueda ser útil al respecto porfavor no dudes en ponerte en contacto conmigo, el tema del diseño de la accesibilidad es una tema que cada día me atrae más y más. Te dejo mi correo. i.otazua@XXX.com Iñaki</i></p> |
| 3 | <p>I leave my contact details in case you need some clarifications: agus-prats@XXX.com and thank you for your interest in improving things. Cheers!</p> <p><i>Dejo mi contacto por si necesita alguna aclaración: agus-prats@XXX.com y gracias a ti por interesarte en mejorar las cosas. salut!</i></p> |
| 4 | <p>Good luck on the road you've chosen</p> <p><i>Onnea valitsemallanne tiellä</i></p> |
| 3) | Further explanation of personal circumstances |
| 1 | <p>I'd like to point out that I am able to move with a crutch, but not autonomous enough to climb stairs easily (without handrails).</p> <p><i>Detallar que soy capaz de moverme con una muleta, pero no lo suficientemente autónomo para subir una escalera con facilidad (sin barandillas).</i></p> |
| 2 | <p>I am congenitally deaf and blind. My tutor has compiled this questionnaire on my behalf.</p> <p><i>Soy una persona sordociega congénita. Mi tutor ha rellenado este cuestionario por mí.</i></p> |
| 3 | <p>I am a person with the ability to climb stairs</p> <p><i>soy una persona con capacidad de subir escaleras</i></p> |

| "ANY OTHER COMMENTS OR REMARKS" | |
|---------------------------------|--|
| 3) | Further explanation of personal circumstances |
| 4 | Questions regarding work or study were difficult to answer, since at the moment I am retired <i>Kysymyksiin työtä tai opiskelua koskien oli vaikea vastata, kun ne eivät kosketa minua tällä hetkellä kun olen eläkkeellä</i> |
| 5 | Disability leave <i>vammaisuus loman</i> |
| 6 | Very hard to travel <i>Erittäin kova matkustaa</i> |
| 7 | I cannot work and I am not an active person <i>En voi työskennellä ja en ole aktiivinen henkilö</i> |
| 8 | My new ramp is too steep, not good. The old one was so much better. <i>Oma uusi ramppi on liian jyrkkä, ei hyvä. Vanha oli niin paljon parempi.</i> |

Source: Own elaboration based on PRM surveys

ANNEX C

LOC/TUS Surveys

C.1 Introduction

This annex complements the case study LOCUS IP presented in chapter 4 of this PhD, with information resulting from the surveys conducted among the participants of LOCUS and also LOTUS (LOC/TUS hereafter) Intensive Programmes. LOTUS IP (2011-2013) was the academic successor and natural continuation of the previous LOCUS IP (2008-2010), after reaching the maximum duration of a standardly established three-year IP.

Let us remember that the aim of LOC/TUS IP was to work on the particular conflictive territory of accessibility in heritage-protected environments. The study took place under a 2-week intensive format and the participants in each workshop included 4-6 students, mainly from the 3rd and 4th year of studies, and 1-2 professors from each partner university. The exercise consisted of providing equal access to people, regardless of their different abilities and without considering those with disabilities as ‘special cases’ limited to restricted spaces or with designated alternative itineraries for reaching their destinations, etc. At the same time, the stability of the city’s heritage was respected.

LOCUS studied 4 Iberian and Balearic cities: Tarragona (Spain - 2008), Girona (Spain - 2008), Évora (Portugal - 2009) and Ibiza (Spain - 2010). While LOTUS was held in 3 French cities: Sète (2011), Bonifacio (Corsica - 2012) and Saint-Denis (La Réunion - 2013).

The surveys were designed and launched during the academic year 2012-13, thanks to free access to the online survey software WEBROPOL, facilitated by TUT. The WEBROPOL software also allows extracting statistics and making customized reports for a deeper reading of the results; for instance, filtering one question and conditioning it to a given answer of a second question. This tool has been used repeatedly to gain a deeper comprehension of the results arising from these questionnaires, which have been presented in detail in chapter 4. *Case study: LOCUS*.

The surveys were specifically directed at the LOC/TUS students, but unfortunately not all participants were reached, since the contact data for many of them was their student email account, which on some occasions was no longer operative due to them having already finished their studies. It is also necessary to remark that those who take the time to answer surveys are usually more likely those who are happy (or very unhappy) with the activity being surveyed. Therefore, the reliability of the results must be also questioned in this sense.

A total number of 75 students answered the surveys. Again, the questionnaires contain descriptive data, i.e., facts like year of studies, age, sex, and nationality; and normative data, i.e., evaluations and opinions about their understanding of accessible architecture prior to and after participating in the workshop. The sample of the survey as well as the full report with the statistical results and intact comments of the students is enclosed next in section C.2 (note that the English has not been corrected there).

C.2

Raw material

C.2.1. Sample of the survey

LOCUS & LOTUS PARTICIPANTS

We want to encourage you to spend a few minutes on the following questionnaire regarding IP LOCUS (2008-2010) and IP LOTUS (2011-2013).

We would like to know about your experience: if it was useful and interesting or if your expectations were not met. We also want to know your opinion on the Erasmus Intensive Programme itself, because your feedback is the most valuable for making improvements.

You will be asked multiple-choice questions, but you can also add remarks or suggestions. The survey is organized into 4 sections:

1. GENERAL DATA: It is absolutely confidential, we only ask for statistics purposes.

2. BACKGROUND & MOTIVATION: Aimed at learning about your previous knowledge and awareness towards the issues discussed in LOC/TUS, and also the reasons why you decided to participate in the programme.

3. EVALUATION OF THE IP: This is the most important feedback we would like to have from you. First, you will be asked about general aspects of the IP; second, about your opinion on universal design; and, third, about your viewpoint on how to balance heritage and accessibility.

4. PERSONAL EXPERIENCE: Finally, we would like your opinion on the LOC/TUS experience: if it has been instructive and how it can be improved.

Thanking you in advance very much for your collaboration!!

1. GENERAL DATA:

1. Gender:

☐ M

☐ F

2. Age:

☐ From 18 to 22

☐ From 23 to 27

☐ From 28 to 32

☐ Older than 33

3. Study year when you carried out the LOCUS activity: (you can tick more than one if you participated twice)

☐ 1st year

☐ 2nd year

☐ 3rd year

☐ 4th year

☐ 5th year onwards

4. Home University

- ☐ EAR (Reus)
- ☐ ENSAM (Montpellier)
- ☐ ENSAM (La Réunion)
- ☐ ETSAV (Vallès)
- ☐ FAUTL (Lisbon)
- ☐ JADE-HS (Oldenburg)
- ☐ LTH (Lund)
- ☐ PK (Cracow)
- ☐ TUT (Tampere)
- ☐ UAUIM (Bucarest)
- ☐ UNIRC (Reggio Calabria)
- ☐ UÉvora (Évora)

5. Nationality: (you can tick more than one)

- ☐ Finnish
- ☐ French
- ☐ German
- ☐ Italian
- ☐ Polish
- ☐ Portuguese
- ☐ Romanian
- ☐ Spanish
- ☐ Swedish
- ☐ Other (please, specify):

6. In which IP have you participated?

- ☐ IP LOCUS – Tarragona (Feb. 2008)
- ☐ IP LOCUS – Girona (July 2008)
- ☐ IP LOCUS – Évora (July 2009)
- ☐ IP LOCUS – Ibiza (April 2010)
- ☐ IP LOTUS – Sète (April 2011)
- ☐ IP LOTUS – Bonifacio (April 2012)
- ☐ IP LOTUS – La Réunion (April 2013)
- ☐ I have participated in more than one IP
(please, specify why):

2. BACKGROUND & MOTIVATION:**1. Do you think that universal design and accessibility teaching should be included in the architecture degree curriculum?**

1 2 3 4 5

Irrelevant ☐ ☐ ☐ ☐ ☐ Essential

2. Did you have any previous experience related to universal design and accessibility before participating in LOCUS/LOTUS?

- ☐ Yes
- ☐ No

2.1. In which study year?

- ☐ Before joining the university
- ☐ 1st year
- ☐ 2nd year
- ☐ 3rd year
- ☐ 4th year
- ☐ 5th year
- ☐ 6th year onwards

2.2. What kind of course?

- ☐ Mandatory
- ☐ Elective
- ☐ Other (please, specify):

3. Before participating in LOC/TUS, your knowledge concerning disabilities was:

- ☐ Close (relative / acquaintance)
- ☐ Far / vague
- ☐ None
- ☐ Other (please, specify):

4. Was LOC/TUS your 1st Erasmus experience?

- ☐ Yes
- ☐ No

4.1. Has participating in LOC/TUS encouraged you to become an Erasmus exchange student afterwards?

☐ Yes

☐ No

4.1.1. Have you been an Erasmus exchange student at any of the LOC/TUS participant universities?

☐ Yes

☐ No

5. Which of the following reasons motivated you to participate in LOC/TUS?

Put in order from the least important to the most important. (Scale: 1 = Not important, 8 = Very important)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Career/Future plans, it provides a good job prospective | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Teachers/Friends strongly recommended participation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I like to visit new places and meet new people | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I was interested in the topic: heritage & accessibility | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I enjoy travelling and the expenses are mostly covered | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| To have an Erasmus experience | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| It was a good opportunity to practice English | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| It is a fast way to get credits: 2 weeks = 4 ECTS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

If other, please specify:.....

.....

3. EVALUATION OF THE IP:

a) General aspects

1. Evaluation of general academic/learning outcomes of the IP:

| | 1 | 2 | 3 | 4 | 5 | |
|------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|-----------|
| Poor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Excellent |

2. Rate the level of importance / your agreement with the following aspects in relation to the LOC/TUS IP:

(Scale: 1= Irrelevant / strongly disagree; 5 = very important/ strongly agree)

| | 1 | 2 | 3 | 4 | 5 |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Theme “Heritage & Accessibility”: opportunity to study a topic that I cannot easily find in my home university | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Travelling: visiting places and making new friends | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Erasmus Programme: contact with different universities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| International workgroups: opportunity to learn from partners from different countries in a cooperative way | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Academic load: 4 ECTS credits | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Intensive character: allows project immersion, empathy with the site and the inhabitants’ problems | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Accessibility teaching approach: bringing the ‘disabled world’ closer by organizing disability simulations and lectures from disabled experts | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

3. End the following sentence by choosing from among the options offered or by giving your own statement: (you can tick more than one)

“Balancing accessibility in topographically complex cities with protected heritage was...

☐ ...normal, just as the kind of academic exercises I am used to solving”

☐ ...too difficult, a bit discouraging”

☐ ...rather simple, I expected something more interesting”

☐ ...disconcerting, never done such an exercise before”

☐ ...quite complex, but challenging!”
do not like travelling

☐ Other (please, specify):

b) Accessibility teaching

4. Given the following sentence, how do you agree with the possible answers?

“The experience of participating in a disability simulation...

(Scale: 1= Irrelevant / strongly disagree; 5 = very important/ strongly agree)

| | 1 | 2 | 3 | 4 | 5 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...was shocking and a little bit scary” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...increased my understanding of the spectrum of users’ needs” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...was a fun game; I would like to repeat it again” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...aroused feelings of empathy and kindness, wanting to do better as an architect” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...changed my approach towards architectural design into something more multi-sensorial” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| ...opened my eyes in relation to the need to suppress architectural barriers” | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

If other, please specify:.....

5. Which of the following concepts do you consider more meaningful in relation to inclusive architecture?

Put in order from the least important to the most important. (Scale: 1 = Not important, 6 = Very important)

| | 1 | 2 | 3 | 4 | 5 | 6 |
|------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Multi-sensorial architecture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Barrier-free architecture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Iconic architecture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Empathic architecture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-----------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Sustainable architecture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Architecture for the disabled | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

6. Which of the following aspects do you consider important when dealing with accessibility?

Put in order from the least important to the most important. (Scale: 1 = Not important, 6 = Very important)

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Accessibility is a new field for professional opportunities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Accessibility is a universal right, essential for guaranteeing the same opportunities | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Guaranteed accessibility is necessary for fulfilling regulations | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Accessibility should be guaranteed, either from the front or rear door. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

| | | | | | | |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Accessibility and suppression of architectural barriers are necessary to achieve complete normalization | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|

1 2 3 4 5 6

Guaranteed accessibility ☐ ☐ ☐ ☐ ☐ ☐

is important for
solidarity and
compassion towards
those who need it the
most

c) Heritage and Accessibility

7. Given the following common attitudes towards historical places, how do you agree with them?

Value from 1 (strongly disagree) to 5 (strongly agree) the level of importance:

1 2 3 4 5

Nowadays we protect ☐ ☐ ☐ ☐ ☐

architecture because it is
old and not necessarily
because it has an
architectural value

Transforming ☐ ☐ ☐ ☐ ☐

architecture to our
current needs has always
been a natural response
of humankind

Giving access to heritage ☐ ☐ ☐ ☐ ☐

should not mean making
alterations to its original
state

Our understanding of ☐ ☐ ☐ ☐ ☐

heritage is overestimated
and we should
protect more modern
architecture as well

Historical places are ☐ ☐ ☐ ☐ ☐

charming and we must
preserve them as they are
as exactly as possible

Heritage must always be ☐ ☐ ☐ ☐ ☐

equally and universally
accessible

8. Has your perception towards heritage changed after LOC/TUS IP?

☐ Yes

☐ No

If YES, please specify, how? why?.....
.....

4. PERSONAL EXPERIENCE:

1. Evaluation of personal outcomes of the IP

1 2 3 4 5

Poor ☐ ☐ ☐ ☐ ☐ Excellent

2. Has the experience of participating in LOC/TUS changed your perception towards disabled people?

☐ Yes

☐ No

If YES, please specify, how? why?.....
.....

3. Has the experience of participating in LOC/TUS changed your perception towards architecture and universal design?

☐ Yes

☐ No

If YES, please specify, how? why?.....
.....

4. After having participated in LOC/TUS, have you had similar experiences with including accessibility in teaching or practising architecture?

☐ Yes

☐ No

If YES, please specify, what? when?.....
.....

5. Do you think that your participation in the IP will help you further in your studies/career?

1 2 3 4 5

Not at all ☐ ☐ ☐ ☐ ☐ Very much

6. Do you think that your participation in the IP will help you find a job?

1 2 3 4 5

Not at all ☐ ☐ ☐ ☐ ☐ Very much

We will appreciate it very much if you can provide any other comments or remarks!

.....
.....

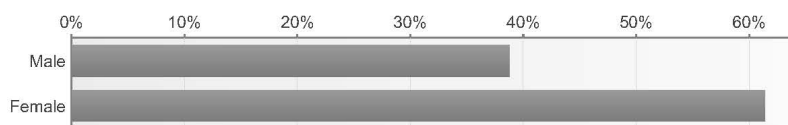
THANK YOU VERY MUCH FOR
YOUR COLLABORATION!!!

C.2.2. WEBROPOL full reports

SURVEY FOR LOCUS & LOTUS PARTICIPANTS - basic %

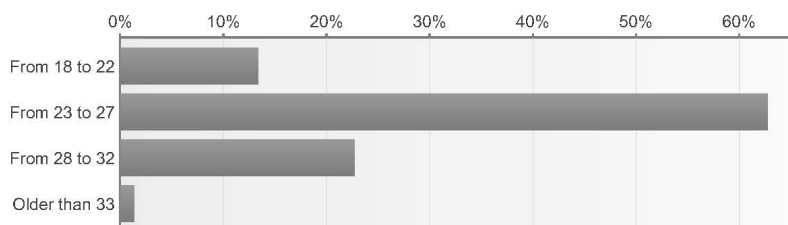
Gender:

Number of respondents: 75



Age:

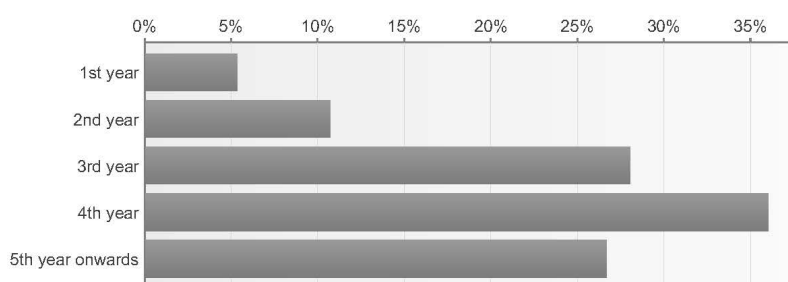
Number of respondents: 75



Study year when you carried out LOCUS activity:

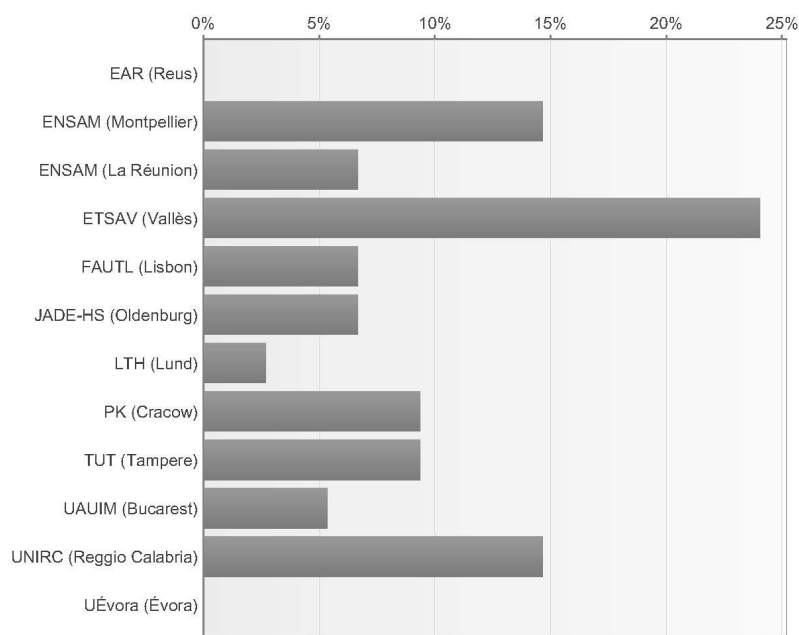
(you can tick more than one if you participated twice)

Number of respondents: 75



Home University

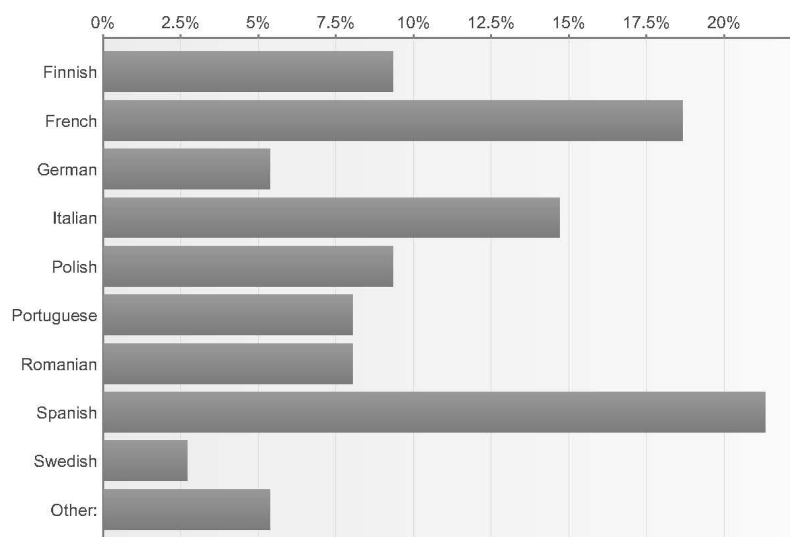
Number of respondents: 75



Nationality:

(you can tick more than one)

Number of respondents: 75

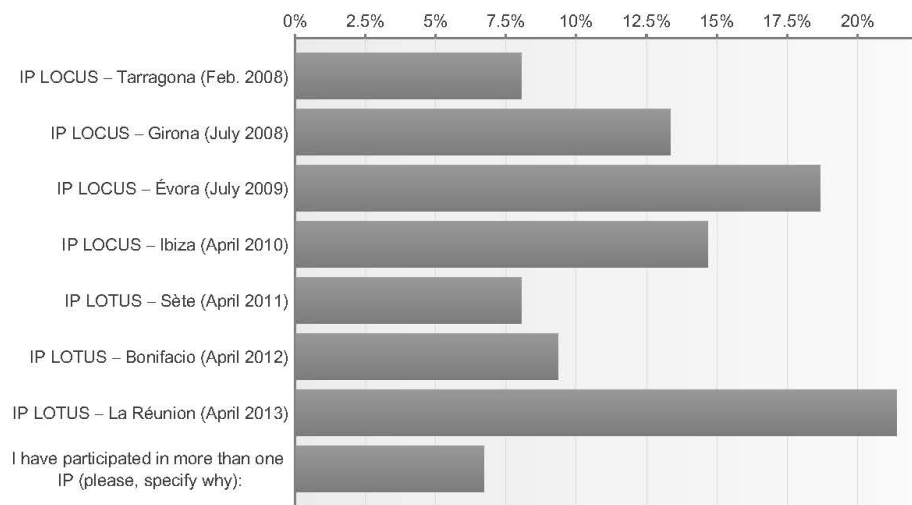


Open text answers: Other:

- Mexican
- Catalan
- Norwegian
- kenyan

In which IP have you participated?

Number of respondents: 75



Open text answers: I have participated in more than one IP (please, specify why):

- Because the experience was great!
- IP LOCUS-EVORA and IBIZA
- I have participated both in Girona that in evora because it was an interesting experience and my professors gave me the possibility to participate in both
- I participated in two IP (Girona and Evora) because the first experience was really great and i tried to participate an other year...it was great too!

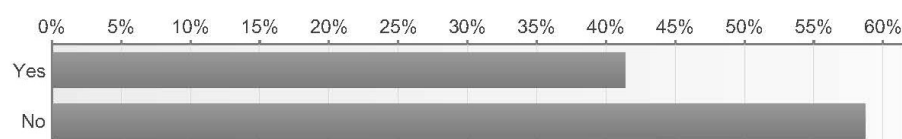
1. Do you think the universal design and accessibility teaching should be included in the architecture degree curriculum?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------------|----|----|-------|--------|--------|-----------|-------|---------|
| Irrelevant | 0% | 0% | 6.67% | 26.67% | 66.67% | Essential | 75 | 4.6 |

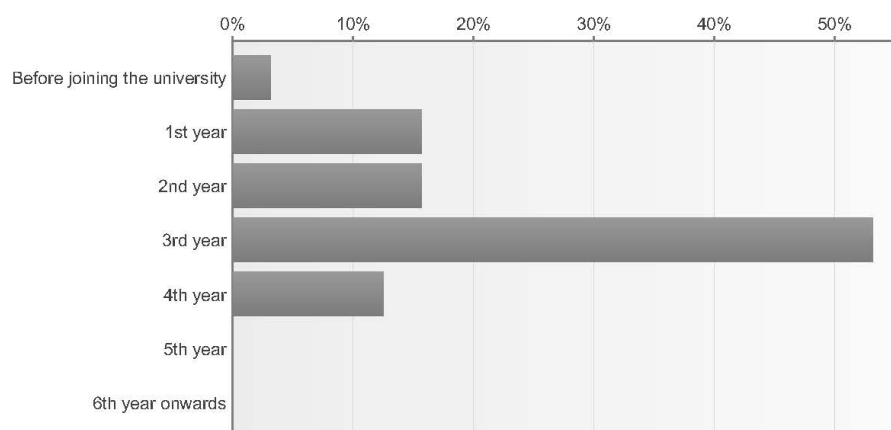
2. Did you have any previous experience related to universal design and accessibility before participating in LOCUS/LOTUS?

Number of respondents: 75



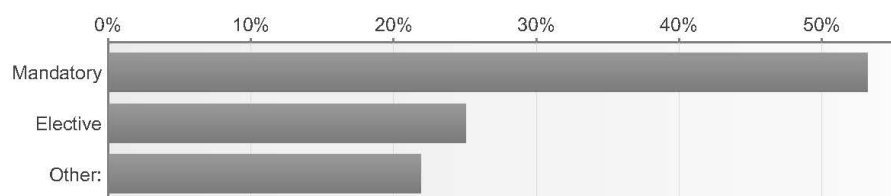
2.1. In which study year?

Number of respondents: 32



2.2. What kind of course?

Number of respondents: 32

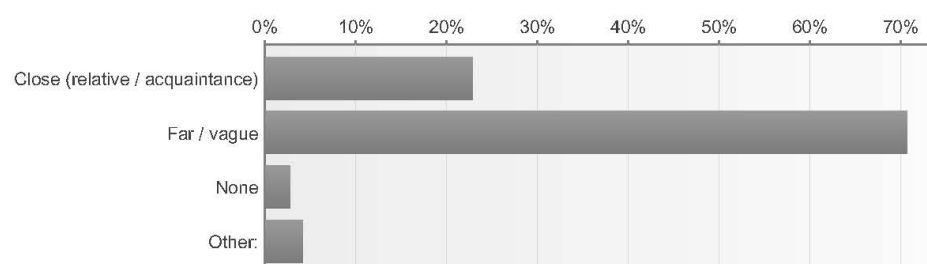


Open text answers: Other:

- Life :)
- Project
- internship
- it was a subject to choose
- External Activities
- job
- self-study

3. Before participating in LOCUS/LOTUS your knowledge concerning disabilities was:

Number of respondents: 75

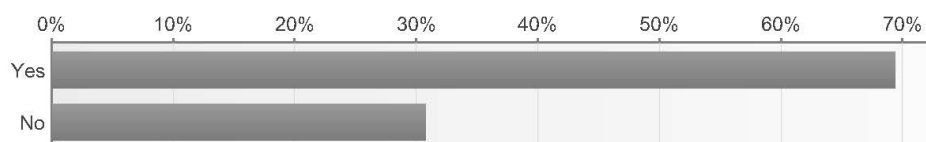


Open text answers: Other:

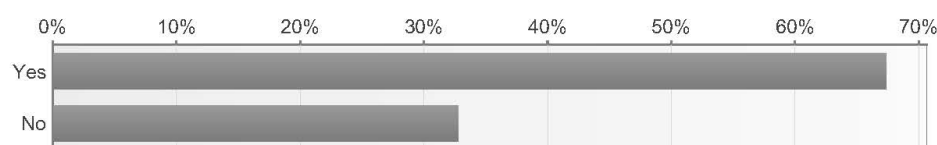
- rather close
- just finished interning for a specialised agency A2H in Montpellier and in my first year our professor took her PDH in a similar field so she was the first one to introduce us to how certain disabilities change the conception and perception of space
- in between close and vague

4. Was LOCUS/LOTUS your first Erasmus experience?

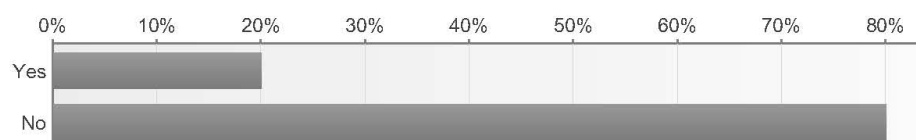
Number of respondents: 75

**4.1. Has participating in LOCUS/LOTUS encouraged you to become an Erasmus exchange student afterwards?**

Number of respondents: 52

**4.1.1. Have you been an Erasmus exchange student at any of the LOCUS/LOTUS participant universities?**

Number of respondents: 35



5. Which of the following reasons motivated you to participate in LOCUS/LOTUS?

Put in order from the least important to the most important. (Scale: 1= Not important, 8= Very important)

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Total | Average |
|---|------------|------------|------------|------------|------------|------------|------------|------------|-------|---------|
| I was interested in the topic: heritage & accessibility | 0% | 0% | 4.29 % | 7.14 % | 11.43 % | 20% % | 21.43 % | 35.71 % | 70 | 6.54 |
| I like to visit new places and meet new people | 1.49 % | 1.49 % | 2.99 % | 14.93 % | 13.43 % | 17.91 % | 22.39 % | 25.37 % | 67 | 6.07 |
| It was a good opportunity to practice English | 8.96 % | 13.43 % | 17.91 % | 17.91 % | 16.42 % | 10.45 % | 13.43 % | 1.49 % | 67 | 4.12 |
| I enjoy travelling and the expenses are mostly covered | 2.78 % | 15.28 % | 11.11 % | 15.28 % | 15.28 % | 8.33 % | 15.28 % | 16.67 % | 72 | 4.94 |
| Career/Future plans, it provides a good job prospective | 7.14 % | 11.43 % | 20% % | 15.71 % | 12.86 % | 14.29 % | 8.57 % | 10% % | 70 | 4.43 |
| To have an Erasmus experience | 7.14 % | 12.86 % | 14.29 % | 8.57 % | 20% % | 15.71 % | 14.29 % | 7.14 % | 70 | 4.61 |
| It is a fast way to get credits: 2 weeks = 4 ECTS | 64.79 % | 16.9 % | 4.23 % | 2.82 % | 5.63 % | 1.41 % | 1.41 % | 2.82 % | 71 | 1.92 |
| Teachers/Friends strongly recommended to participate | 6.94 % | 22.22 % | 19.44 % | 12.5 % | 8.33 % | 18.06 % | 8.33 % | 4.17 % | 72 | 4.01 |
| Total | 12.52 % | 11.81 % | 11.81 % | 11.81 % | 12.88 % | 13.24 % | 13.06 % | 12.88 % | 559 | 4.58 |

If OTHER, please specify:

Number of respondents: 3

- What motivated me the most was the chance to work with a multicultural team for a change, students with different approaches, who work with different computer programmes for instance, and have a different method regards the same problem (disability). It turned out to be everything I had expected and more. In those two weeks the amount of information you absorb it's stupendous. I recommend this experience to any architecture student!
- Thank you for evrything again, share this experience with international teacher and student work on this project wich 's a mix of sociologique/human value and design and architecture was fantastic.
- I was offered the opportunity by the University, and I accepted it gladly. A great chance to learn and experience something truly exceptional - who would say no? Especially when nearly all expenses were covered for us.

1. Evaluation of general academic/learning outcomes of the IP:

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------|-------|-------|------------|------------|------------|-----------|-------|---------|
| Poor | 1.33% | 2.67% | 17.33 % | 41.33 % | 37.33 % | Excellent | 75 | 4.11 |

2. Value your level of importance/agreement of the following aspects in relation to the LOCUS/LOTUS IP:

(Scale: 1= Irrelevant / strongly disagree; 5 = very important/ strongly agree)

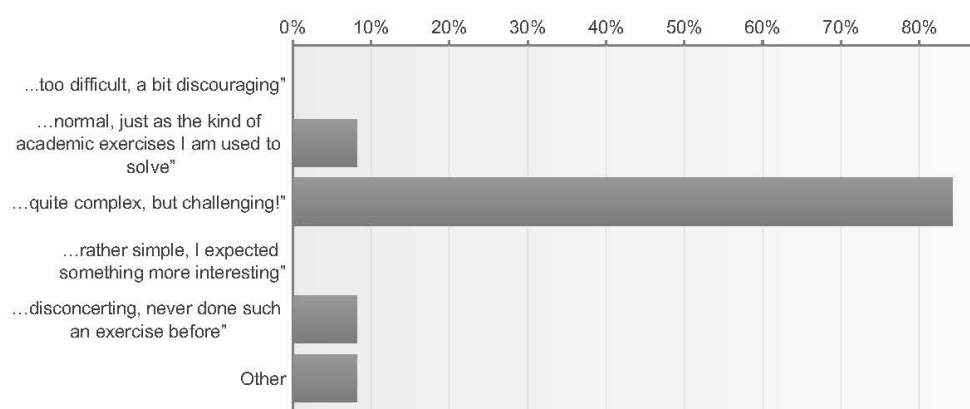
Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|--|--------|--------|--------|--------|--------|-------|---------|
| Erasmus Programme: contact with different universities | 2.67% | 2.67% | 18.67% | 37.33% | 38.67% | 75 | 4.07 |
| Theme "Heritage & Accessibility": opportunity to study a topic that I cannot easily find in my Home University | 0% | 5.33% | 5.33% | 30.67% | 58.67% | 75 | 4.43 |
| Intensive character: allows the project immersion, empathising with the site and the inhabitants problems | 1.33% | 1.33% | 12% | 45.33% | 40% | 75 | 4.21 |
| Accessibility teaching approach: bringing closer the 'disabled world' by organizing disabilities simulation and lectures from disabled experts | 0% | 0% | 4% | 26.67% | 69.33% | 75 | 4.65 |
| Travelling: visiting places and making new friends | 1.33% | 1.33% | 21.33% | 24% | 52% | 75 | 4.24 |
| International workgroups: opportunity to learn from partners from different countries in a cooperative way | 0% | 1.33% | 9.33% | 22.67% | 66.67% | 75 | 4.55 |
| Academic load: 4 ECTS credits | 30.67% | 17.33% | 28% | 16% | 8% | 75 | 2.53 |
| Total | 5.14% | 4.19% | 14.1% | 28.95% | 47.62% | 525 | 4.1 |

3. End the following sentence by choosing among the offered options or by giving your own statement: "Balancing accessibility in topographically complex cities with protected heritage was..."

(you can tick more than one)

Number of respondents: 75



If OTHER, please specify:

Number of respondents: 8

- But I soon discovered that students from other universities has neither basic knowledge about accessible design nor an emphatic attitude, which made working a lot harder.
- An interesting and motivating challenge
- interesting and very educative, I liked it a lot
- Exhausting!
- an experience that changed my hole point of view about designing our surrounding world - and this combined with making good friends."
- Very interesting experience, that shows in excellent way the scale of accessibility problems in urban space. Nothing better explains difficulties connected with various disabilities than such simulation/practice exercises.
- challenging, exciting, nerve-wracking and fun all in the same time, never done such an exercise before
- Not as difficult as I was thinking and really challenging and interesting

4. Given the following sentence, how do you agree with the possible answers? "The experience of participating in a disability simulation..."

(Scale: 1 = irrelevant/ strongly disagree, to 5 = very important/ strongly agree)

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|--|--------|--------|--------|--------|--------|-------|---------|
| ...was a fun game; I would like to repeat it again" | 17.33% | 21.33% | 26.67% | 16% | 18.67% | 75 | 2.97 |
| ...was shocking and a little bit scary" | 42.67% | 18.67% | 18.67% | 10.67% | 9.33% | 75 | 2.25 |
| ...opened my eyes in relation to the need of architectural barriers supression" | 1.33% | 2.67% | 12% | 16% | 68% | 75 | 4.47 |
| ...changed my approach towards architectural design into a more multi-sensorial way" | 0% | 1.33% | 10.67% | 34.67% | 53.33% | 75 | 4.4 |
| ...increased my understanding of the spectrum of users needs" | 1.33% | 0% | 5.33% | 24% | 69.33% | 75 | 4.6 |
| ...arose feelings of empathy and kindness, wanting to do better as an architect" | 2.67% | 1.33% | 16% | 28% | 52% | 75 | 4.25 |
| Total | 10.89% | 7.56% | 14.89% | 21.56% | 45.11% | 450 | 3.82 |

If OTHER, please specify:

Number of respondents: 7

- Well that's what I would have said if I wouldn't had a disability already! (I didn't try the blind exercise, it would have been too risky!)
- one of the questions that came up - how to deal with the different age of disabled people and there specific barrier.
- Question nr 6 doesn't work - can not chose more than one point in whole form.
- frustrating not being able to go where i wanted to and scary having to trust the others so much more
- iThe experience itself was not shocking or scary, but it does leave you thinking and realising how how difficult that reality is and of course, imagining yourself in that position can be a bit scary
- i don't think it was real enough.it was okay to give student a slight idea of what it's like but the real, complex, every-day difficulties weren't there. a stroll through other parts of the city would have been better than a parcour in a specific spot with made-up ramps.
- a game?

5. Which of the following concepts do you consider more significative in relation to inclusive architecture?

Put in order from the least important to the most important (scale: 1= Not important, 6 = Very important)

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | 6 | Total | Average |
|-------------------------------|------------|------------|------------|------------|------------|------------|-------|---------|
| Barrier-free architecture | 4.29% | 7.14% | 5.71% | 11.43 % | 31.43 % | 40% | 70 | 4.79 |
| Sustainable architecture | 4.23% | 5.63% | 26.76 % | 16.9% | 22.54 % | 23.94 % | 71 | 4.2 |
| Architecture for the disabled | 6.85% | 19.18 % | 16.44 % | 28.77 % | 17.81 % | 10.96 % | 73 | 3.64 |
| Multi-sensorial architecture | 4.17% | 15.28 % | 16.67 % | 22.22 % | 22.22 % | 19.44 % | 72 | 4.01 |
| Iconic architecture | 63.51 % | 25.68 % | 4.05% | 4.05% | 2.7% | 0% | 74 | 1.57 |
| Empathic architecture | 11.27 % | 25.35 % | 28.17 % | 16.9% | 8.45% | 9.86% | 71 | 3.15 |
| Total | 16.01 % | 16.47 % | 16.24 % | 16.71 % | 17.4% | 17.17 % | 431 | 3.56 |

6. Which of the following aspects do you consider important when dealing with accessibility?

Put in order from the least important to the most important (scale: 1= Not important, 6 = Very important)

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | 6 | Total | Average |
|--|------------|------------|------------|------------|------------|------------|-------|---------|
| To guarantee accessibility is necessary to accomplish regulations | 17.81 % | 30.14 % | 30.14 % | 8.22% | 10.96 % | 2.74% | 73 | 2.73 |
| Accessibility is an universal right, essential to guarantee the same opportunities | 2.7% | 2.7% | 8.11% | 9.46% | 13.51 % | 63.51 % | 74 | 5.19 |
| Accessibility and suppression of architectural barriers are necessary to get complete normalization | 5.48% | 4.11% | 17.81 % | 24.66 % | 31.51 % | 16.44 % | 73 | 4.22 |
| To guarantee accessibility is important for solidarity and compassion towards the ones who need the most | 16.9% | 12.68 % | 11.27 % | 28.17 % | 16.9% | 14.08 % | 71 | 3.58 |
| Accessibility is a new field for professional opportunities | 38.89 % | 19.44 % | 15.28 % | 9.72% | 16.67 % | 0% | 72 | 2.46 |
| Accessibility should be guaranteed, either from the front or rear door. | 14.29 % | 28.57 % | 17.14 % | 21.43 % | 12.86 % | 5.71% | 70 | 3.07 |
| Total | 15.94 % | 16.17 % | 16.63 % | 16.86 % | 17.09 % | 17.32 % | 433 | 3.54 |

7. Given the following common attitudes towards historical places, how do you agree with them?

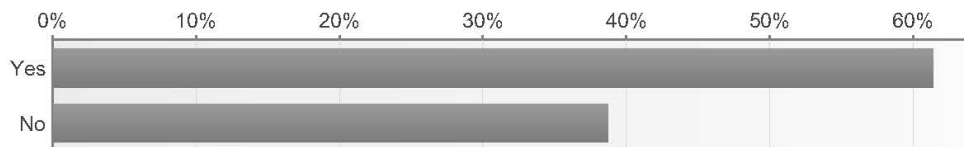
Value from 1 (strongly disagree) to 5 (strongly agree) the level of importance:

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | Total | Average |
|--|--------|--------|--------|--------|--------|-------|---------|
| Heritage must be always equally and universally accessible | 4% | 8% | 18.67% | 24% | 45.33% | 75 | 3.99 |
| Giving access to heritage should not mean to make alterations to its original state | 6.67% | 9.33% | 30.67% | 34.67% | 18.67% | 75 | 3.49 |
| The understanding of heritage is overestimated and we should defend more modern architecture as well | 24% | 38.67% | 17.33% | 14.67% | 5.33% | 75 | 2.39 |
| Historical places are charming and we must preserve them as exactly possible as their are | 16% | 13.33% | 25.33% | 26.67% | 18.67% | 75 | 3.19 |
| Nowadays we protect architecture because it is old and not necessarily because it has an architectural value | 28% | 22.67% | 26.67% | 17.33% | 5.33% | 75 | 2.49 |
| Transforming architecture to our current needs has been always a natural response of the human kind | 4% | 5.33% | 29.33% | 24% | 37.33% | 75 | 3.85 |
| Total | 13.78% | 16.22% | 24.67% | 23.56% | 21.78% | 450 | 3.23 |

Has your perception towards heritage changed after LOCUS/LOTUS IP?

Number of respondents: 75



If YES, please specify: How? why?

Number of respondents: 24

- we got sorts of improbable ways to integrate the accessibility in order to preserve the heritage, interenting to develop them deeply.
- Before Locus I wasn't familiar with the density of the city structure in Southern heritage. Somehow I feel we have it a bit easier here in the North. Ironically it's because most of our wooden towns have already been demolished. In the South, the heritage is still the everyday environment for people, which I envy. While I feel that accessibility isn't taken seriously enough in the South, I'm also glad that it isn't taken with the rigidity of my native Finland either, because that would probably lead to abandoning and/or demolishing the valuable buildings.
- Most of the historical centers that we today cherish and appreciate, have been conceived as inaccessible. It is very interesting that by making them more accessible, even with very discrete interventions, we can totally change and, in a way, upgrade them, make them more contemporary (not in style but in use and atmosphere).
- I had not realized the majority of heritage sites are inaccessible to everyone. It is a challenge to find a way to remedy the situation without altering the original aspect
- I understood the value of heritage, but after LOCUS I learned discreet ways of multi-sensorial architectural design.
- In the theoretical lessons I learned different approaches of how to combine contemporary barrier-free and sustainable architecture with historical buildings or places. Some of the ideas helped me afterwards when I worked on my Final Project, which was based on this Workshop. My perception after the Workshop is that we

need to reinforce the synergies between the "Old" and our contemporary needs, waving the accessibility into the project in the most natural way, and this is only possible with a fearless (but respectful) approach to the Heritage.

- The experience in Tarragona has made me more aware of the presence of heritage in places I go and its importance in places I design.
- Working in heritage environment with local architects and students gave me new perspectives and ways of working.
- I've become more aware of the relation between architecture and heritage.
- The need to turn ancient city centers into accessible places
- We don't just protect architecture just because it is old n'or just because it's architectural value, but also because at a certain point in time that architecture was a mirror of a civilisation's belief and it's way of living. Seeing people live day by day inbetween layers and layers of history without devouring it made me think of their respect and deep understanding of their past.
- I never thought about the rights of architects (or governments) to alterate cultural heritages. The preservation of historical places / buildings was something absolutely obvious to me. Needs of the disabled never really came to my mind before, atleast not concerning the accessibility to heritage. Providing equal chances and abilities to the entire society is a very challenging matter for architects / designers. The whole issue should not be a question of regulations, but of social empathy and ofcourse smart design.
- My perception towards heritage is much more respectful than before, not only because of Locus but some other jobs and courses as well.
- because it made me understand that make accessible heritage doesn't mean to destroy its value, the important is that the interventions are well designed and studied!
- accessibility IS matching with heritage. If heritage can't be touch, it's our job to find a way so that disabled persons can access to it
- I saw how could be the balance and contrast between heritage and new design solutions which adapt architecture to the current needs of society.
- new ways of seeing it, of using it.
- It was important to understand that heritage have to be accessible, but not obviously in its totality, because some things are impossible to change. The most important goal to reach is, if the place is not accessible in the way you can not move around, architecture have to make accessible to the looks and the view.
- I had never thought about the relation between heritage architecture and accessibility before. Its like we delete the problem of our mind because we don't experience that problem. After LOCUS I started to see that problem from another point of view and to consider it in all my projects, modern architecture or restoration of old one.
- I want to be a good architect, who can help disabled people. I don't want to project only new , nice building but also accessible.
- I'm become more sensitive to the view of architecture in detail. Especially in the urban places and spaces I have to subconscious analyze the situation for disable and not disable people.
- How to deal with heritage sites..my hometown is also world cultural heritage(unesco) and through the programm i was able to learn what i can do there to enhance the accessibility and touristic attraction! confronted only with positive experience!!cant wait for more!!
- Yes, because today, i think heritage architecture could improve the dialogue with the user needings. An heritage will survive with memories, feelings, wich are sharing with different kind of user, people.
- The architectural value of heritage must come second place to accessibility!

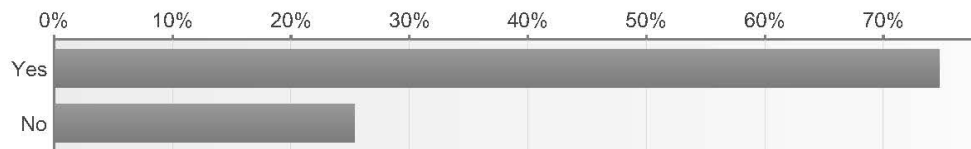
1. Evaluation of personal outcomes of the IP

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------|----|-------|----|--------|-----|-----------|-------|---------|
| Poor | 0% | 1.33% | 4% | 42.67% | 52% | Excellent | 75 | 4.45 |

2. The experience to participate in LOCUS/LOTUS has changed your perception towards disabled people?

Number of respondents: 75



If YES, please specify: How? why?

Number of respondents: 35

- I can empathize more. I appreciate a lot that the LOCUS approach was not at all preaching, which is too often the case in the Finnish education. Because in the end, preaching backfires.
- I better understand what they need and why they need what they need.
- I have learned to appreciate their courage and strength more.
- Meeting blind architect and seeing the city blind was eye opening
- I understood that their lives is too complicated for complicate it even more with accesibility problems
- I learned interesting details about blind people.
- Now I can understand their discomfort in moving because I simulated a typical situation so I try to design thinking about this
- It made me more aware of space barriers for disabled people. And it made me factor them in whenever I think a project.
- Also, it made me reflect more on the subject generally speaking. And I am very happy to have shifted my attitude from pity or empathy to normality!
- I had prior to that not been in such a direct relationship with disabled people so the workshop made me establish a personal connection to the challenges faced.
- It was really good to contact with people that deal so naturally and bravely with their disabling.
- Multisensorial approach became more important.
- Accessibility matters are something that should be taken in account when designing the same way we do with structures or cosntruction.
- A) I get to know some
- B) I was acting like - changed my point of view (trial)
- C) People are different in their needs and no one knows what is coming up next
- Now I understand better their architectural needs.
- Because I experienced a weel-chair and being blind/half blind. I learned some of the difficulties of disabled people and that is very important for my personal and professional growth.
- Even though i knew regulations, understood their logic, i never got to experience the city as a disabled peson, it was way harder than i though plus i got to hear what disabled thought about the same pathway i was wwalking on. Never thougt that the tiniest detail makes a huge difference.
- Some times, you think you know, but you don't have a idea of the meaning of being disabled.

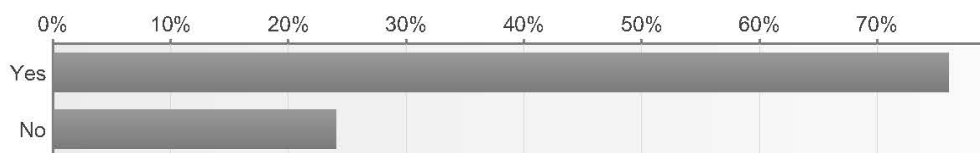
Experience in my own the "same" as a disabled person really changes everything.

- I'm more interested about that kind of problems.
- Using a wheelchair myself and not very successfully trying to manage slopes and other difficult barriers opened my eyes.
- I feel closer to disable people needs and its vulnerable situation.
- I started noticing more details which have an influence on standard of live disabled people.
- I've been in their situation for a little bit of time, I found some problems that now I think about them when i'm designing.
- I have learned a lot of facts about disabled people, even if I was already aware about some simple things links to the uses, I think I learned more things about blinded and deaf people and architecture.
- I now acknowledge the importance of accessible architecture for the community.

- i understand now that a small obstacle can be something more for a diseable people
- The circuit in a wheelchair was very important to me, because it is not the same when you see it or when you live it. It's an exercise that every architect should do for a whole day!
- Because for first time in my life I get in the role of a disabled person, that way I was able to REALLY understand how dificult for them can be some things...
- You realise about how hard it is for them.
- being blind was very emmotional!as a muslim i thank God mostly for this kind of things which we think its normal to have them,eyes, ears. hands, legs....food, pen(give a kid a pen he will write)
- wheelchair was very challenging-since then i see this kind of people more often!
- It will be constituent in my designs.
- now I can understand better them..
- The fact to test the daily situation of disabled people make me understand the testing for the daily situation of disabled people has helped me understand how difficult it is to move on the town. The slightest obstacle quickly becomes impassable. The architect have to change that.
- Participating in activities of the program makes you feel empathy for disabled people and put yourself in their situation does change the way you think
- Aware what is happening around us as inadequate sidewalks.
What is important, it is especially easy accessibility for people with disabilities (such as wider sidewalks and protect against the sun for people with reduced mobility). Also for the deaf and blind, there are not many landmarks in the city to help them to be independent and above all to be comfortable.
- Simulation part was a real eye opener!

3. The experience to participate in LOCUS/LOTUS has changed your perception towards architecture and universal design?

Number of respondents: 75



If YES, please specify: How? why?

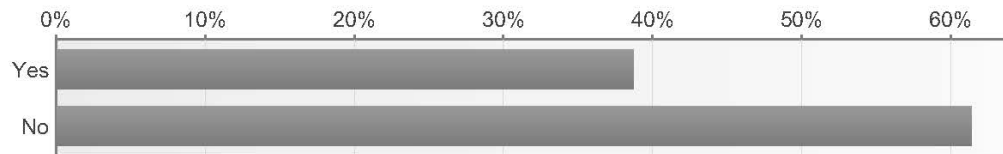
Number of respondents: 38

- I felt that we were already more advanced on that issue in my university. I didn't learn much there.
- More than a change n my perception i feel I worked deep in the knowldlege giving me more
- i understood the importance of ease of access and comfort of use in architecture, especially in public spaces and public buildings.
- Accessible architecture benefits everyone, not just people with dissabilities
- Now I can really that architecture should be accessible for everybody and to achive this carefully designed.
- I understood that we- all architects- need to understand how important is to design architecture for all
- I understood better that incorporating the senses in the fields of design and architecture can enlarge the experience of space.
- It was the start point of my enthusiasm for this field. I based my Final Project on the results of this Workshops, and from then on I've continued learning and experiencing a lot on this topic!
- Architecture must be for everybody in understanding and accessibility
- An experience like this makes you realize that good architecture means many things, not just iconic architecture or composition or materials. Good architecture serves people's needs, in every aspect.
- Accessibility changed from being a code to meet into a personal goal to achieve.
- It made me think about the huge amount of existing possibilities to promote universal design

- It showed to be possible to "project" (design) for all.
- Experience gave understanding that it's not separate part of design task. In my country we are too strict with regulations and because of that we use too many times standard solutions, which leads separate routes to disabled and other people and nonoptimal experiences for all users.
- I am more sensitive to the problem.
- I understood better how accessibility is important in every single project, and how we should always try to think as a disabled person in order to make universal design
- As I said before, I knew the regulations for accessible architecture, but I never before got to experience it through my different senses. I found that very revealing and I got more experience more with my projects.
- I became careful about complex design full of architectural barriers.
- Meeting disabled professionals in the field of architecture and hearing their stories awakened my interest for universal design. It got me thinking about social responsibility and a bigger picture of what architecture is (should be) about.
- I do always take disabled people into account during the project phase.
- It has made me think more about accessibility in the context of heritage.
- Yes, because it has expanded my vision, that is when I think of accessibility I think not only to disabled people but to all people for which an element can be an obstacle, for example a mother with stroller, a grandfather with his stick, a lady with her shopping bags.
- It's really important that it has only ONE access for ALL. A different and further access for disabled persons is like discrimination...
Plus, it's really important to respect the 5% (maximum) of slope, otherwise it is too difficult to reach the place.
- Yes, because I learnt more how to join it together.
- Yes because it was the first time I was really thinking about it in a project.
- Most times, when I was designing a project and I had to solve an accessibility problem I thought that the regulation were too hard (for example the % of the slopes). After experiencing it, I could see how important it is to think about it.
- Now I look at architecture with more responsibility and empathy towards its users.
- After LOTUS I take care about accessibility in architecture for all kind of disabled people, not just for the ones using wheelchair.
- Include the disabled people in a project can improve it and lead me to think about things that normally I don't think.
- Essential for 10%
Necessary for 40%
Comfortable for 100%!
- And it still doesn't mean that it can't be elegant & beautiful!
- Now I understand that the way a building looks is not what is most important.
- We as architects MUST do a good design of the city.
- Architecture is not normal!
- Design first, should be useful, but with this experience we learn that in design, it doesn't matter for who we are imagining something. We always have to bring something fun and colorful. Design most when it's give an answer on sensitive subject should always bring a peace of happiness and energy.
- The fact to work with persons of different countries with different cultures, different ways of thinking, of conceiving and the different lectures changed my perception
- Now you look more at architectural barriers and at details previously you didn't look.
- Often we see everywhere the signs for people with disabilities like for elevators. For us, this is not what he ought to do in our project, but to make the architecture more than available: for example, replace the stairs with ramps so that everyone did not feel like it is only for people with disabilities, but for everyone.
- I'm not sure what is meant here with universal design.. But I think it was not until this workshop that I actually understood what it could be, if all of us were equal in public spaces. What an encouraging goal.

4. After having participated in LOCUS/LOTUS, have you had similar experiences about including accessibility in teaching or practising architecture?

Number of respondents: 75



If YES, please specify: What? when?

Number of respondents: 23

- I answered no, but I specify anyway. I was in the very end of my studies, so there was no chance for me to have another experience. However I do know that interactive accessibility teaching is in use in my university.
- Classes and architectural practice in which i tried to incorporate these regulations
- Participating in several Projects related to this field. Probably one the most remarkable has been the "Schindler Award", an international barrier-free architecture competition in which I participated in the 2010 and 2012 edition.
- Yes, i took part in Schindleraward architecture competition about accessibility.
- not in a direct way, but since locus is something that i always care about.
- But I mention it if there is no accessibility.
- Only during my final project, because it was about getting accessible an unreacheable heritage site.
- Accessibility as a main idea/background to develop a project in a project course.
- i applied it in my projects (school project and office work, small grou projects), but nothing similar to a workshop or a workgroup as LOCUS
- I tried to make sure to include big enough doors and entrances as well as elevators and appropriate restrooms in my university projects. Most our professors required this anyhow.
- an elective curse at my university. the experience wasn't good, though. Generally, I have tried to include the matter as a personal challenge/duty in all my projects, without being specifically asked.
- yes, because when I design I always pay attention in order to make my design accessible, and this is also because in Italy there is a law that force to make all public buildings accessible.
- Yes, in the projects given.
- During my work at architectural office due to the local regulations' demands.
- During my professional work
- I spend 6 months in Erasmus where I have lesson- project for accessible people.
- In my final project I envisioned a social rehabilitation center for former drug users, and many of the things I have learned during the Lotus experience, helped me generate a more coherent opinion.
- In the projects at the architecture school, we had to include the law about the accessibility.
- not yet, but for sure i will have them.
- a studio project just few weeks before the LOTUS workshop.
- My current project takes into account many aspects that have been taught in the workshop
- Just after participating in LOTUS, we had a group project on the theme of automation home for people with disabilities (6 individual houses). We chose two types of disability in our project: the deaf and disabled people with great topographical constraints (20-25% slope or inclinaison !).
- And also make this "neighborhood" more user-friendly thanks to its surroundings (like music school and college), creating spaces and activities open to the public for a social mix (musicals, theater ...).
- Everyday at work. The other people seem who I work with seem to think an accessibility ram is just a necessary machine. The company I work in makes schools

5. Do you think that your participation in the IP will help you in your further studies/career?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------------|----|-------|--------|-----|-----|-----------|-------|---------|
| Not at all | 0% | 2.67% | 17.33% | 40% | 40% | Very much | 75 | 4.17 |

6. Do you think that your participation in the IP will help you in finding a job?

Number of respondents: 75

| | 1 | 2 | 3 | 4 | 5 | | Total | Average |
|------------|--------|--------|-----|--------|----|-----------|-------|---------|
| Not at all | 14.67% | 26.67% | 32% | 22.67% | 4% | Very much | 75 | 2.75 |

We will appreciate very much if you give us any other comments or remarks!

Number of respondents: 23

- Thank you for making us aware that we sometimes tend to take many things for granted
- What I was thinking, that it might be worth to spread the knowledge about "accessible design" not only by having such a workshops but e.g. by doing a website where people can send their student projects and somebody can give some suggestions or by visiting university - why bc. then you can talk with lot more people about design for all idea - not only with 20 workshop participants - don't get my wrong I think workshop was great !

Cheers,

Dariusz from Poland (Cracow)

- Thank you so much for the opportunity. It was a wonderful experience.
 - I truly wish you all the best for the PhD!
 - I believe the work group and theme was well structured. The possibility to embrace this wonderful city within a real program, makes it for me the best possible outcome.
 - I want to give big thanks to all the participants but especially to Marta Bordas and to Carlos Mourao about their commitment and personal approach to teaching accessibility.
 - Just a comment, after few years past thanks for the good organization of the workshop.
 - It was a wonderful experience where we got to learn so much from so many different people with different backgrounds and from different countries. It was very intense and fun. Loved the people, loved the place, loved what we were doing all the way.
 - Thanks for the great organisation of the workshop and all the best for your PhD research.
 - generally, it was a good experience and I'd like to thank everyone that made it possible for me to be there. Thanks!
 - It was a lifetime experience! very interesting concerning architecture for all as well as meeting amazing people (teachers and the other student). Please keep doing it because it was just AMAZING!
 - I think the LOCUS is a great course. Thank U for everything!!
 - I loved the experience and it has enriched the way I look at architecture and the approach I take while designing.
 - I enjoyed a lot lessons during LOTUS, and I think I'm more open mind now. I also made a good friend there.
- As a negative valuation I'd say that the weeks there weren't comfortable at all. Accommodation was the worse part of the experience.
- It is a wonderful programme, which was really challenging. It is not only opening minds on problems of accessibility and needs of disabled people. It really broadens horizons!
 - Given that the regulations concerning accessibility are different in every country, maybe it would be

recommendable that every student was given a binder about the particular rules in their countries.

- a job is not my priority, how am going to work when i havent learn from masters?(Valerio,Miguel and all the nice profs who were there??honestly my priority is to learn first and then a job will come, no doubts!!

have a nice day marta ;)

- Again, again Thank you. We had an approach of architecture empathie, sensitive and human during all these days. We learn a lot, watching, listening, how people lived in a city, who they are, wich are thier needing ? Pushing us to be more concerned, open minded on human situation, wich we're seeing, it will help us evryday.
- increase the number of participants!!!!
- Amazing experience, wonderful teachers, I'd like to do it again and again !
- I think that, for the importance of the work we had to do, the participants should have been older and with a little more experience of both english language and pc programs of design.
- Practical things (internet, time tables, transports) could have worked a bit better, and it would have saved precious working time.

Also, it would be nice if all students included would be motivated by the subject and not only by sunny beaches - age, and level of studies is key here, 3rd/4th year should be demanded.

Otherwise, a real eye opening experience. Not only to accessibility, nut to the concept of really accepting all of us in the same public spaces, be it with a "cost" (aesthetical or financial) or not. You can't put a price on equality.

Also, extremely interesting to see the teaching methods and attitudes of both professors and students from other countries, ever amplified by the stressful timetable. This gave me real insight into where I'm / my University is situated in the international scene of "how things are done". It helps you understand your own way of doing in a broader sense. Gives confidence. Gives perspective. Very healthy and very needed. We all get so easily lost in our own little worlds.

- If there is a competition I don't think its proper that the same teachers who guide our work gets to give the final scores for our works. The competition is nice but not necessary.



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